



UNRCCA
The United Nations Regional Centre
for Preventive Diplomacy for Central Asia

OSCE

2019 WATER YEARBOOK: CENTRAL ASIA AND AROUND THE GLOBE

Tashkent 2020

WATER YEARBOOK:

CENTRAL ASIA AND
AROUND THE GLOBE

2019

Tashkent 2019

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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 (Sh. Kuchkarov, 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), EC-IFAS (S. Eyeberenov, I. Djuraev), ICSD Secretariat (B. Mamedov), Executive Directorate of IFAS in Kazakhstan (B.K. Bekniyaz), GEF Agency of IFAS in Uzbekistan (V.I. Sokolov), CAREC (E. Strikeleva, T. Reznikova).

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

Higher Education Institutions and Research Institutes: KazNAU (T.I. Yespolov, A. Aldiyarova), Kazakh-German University (B. Janusz-Pawletta, M. Yodalieva), Nazarbaev University (S. Xenarios), TarSU (M.N. Sarybekov, M. Akhmetjanov), KSUCTA (A.A. Abdykalykov, E. Mambetov), KNAU (R.Z. Nurgaziev, E. Drugaleva), KRSU (V.I. Nifadyev, G.I. Loginov), TAU (A.F. Salimzoda, F. Murodov), National University of Uzbekistan named after Mirzo Ulugbek (A.R. Marakhimov, G. Umirzakov), TIAME (A.T.Salokhitdinov), Berdakh KSU (A.M. Reymov, S.Gabbarov), RIIWP (I.E. Makhmudov), RUE CRICUWR (S.A. Dubenok), FSBI "RosNIIVKh" (N. Prokhorova).

International partners: OSCE (R. Ernst, S. Jafarzadeh), UNECE (S. Radnaaragchaa), IWAC (S. Akhmedov), Rivers without Boundaries Coalition (E. Simonov), UNRCCA (N. Khudayberganov), GIZ (K. Milow), SDC (A. Wehri), ADB (Ya. Siddiqi), World Bank (U. Yang), Geneva Water Hub and University of Geneva (M. Tignino), GWP (Yu. Yasuda), ICID (I. Bondarik), SIWI (M. Klimes, A. Said), UNESCO (N. Kim), IWRA (I. Deregiibus), EU-CA Platform (A. Krutov), OECD (M. Griffiths), UNEP (A. Kurmanova, O. Atymtaev).

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Prepared with the support of the United Nations Regional Centre for Preventive Diplomacy for Central Asia

Published with the support of the Organization for Security and Co-operation in Europe Project Co-ordinator in Uzbekistan (OSCE PCUz)

Content

List of Abbreviations	8
Preface	12
Section 1. 2019 Calendar of Events	15
Section 2. Water Management Situation in the Aral Sea Basin	27
2.1. Water Management Situation in the Amu Darya and the Syr Darya basins.....	28
2.2. Monitoring of Changes in the Water Surface Area of the Large Aral Sea and the Amu Darya Delta	29
2.2.1. Water Supply to the Aral Sea and the Amu Darya Delta	30
2.2.2. Dynamics of Changes in the Open Water Surface and Wetland Area of Eastern and Western Parts of the Large Aral Sea	31
2.2.3. Lake Systems of the Amu Darya Delta	31
2.3. Integrated RS-and Ground-Based Studies of the Exposed Bed of the Aral Sea	34
2.3.1. RS-based Observations over Water Surface and Wetlands of the Large Aral Sea and the Exposed Seabed	34
2.3.2. Results of the Expedition to the Exposed Bed of the Aral Sea in September-October 2019	36
Section 3. IFAS and Other Regional Organizations in Central Asia	53
3.1. International Fund for Saving the Aral Sea	54
3.1.1. Initiatives of the Presidents of CA states voiced at XII Summit of the Heads of IFAS Founder-States.....	54
3.1.2. UN-IFAS Cooperation	55
3.2. Executive Committee of IFAS and its National Branches	55
3.2.1. Executive Committee of IFAS.....	55
3.2.2. Regional Center of Hydrology.....	57
3.2.3. Executive Directorate of IFAS in Kazakhstan	57
3.2.4. IFAS Agency for Implementation of the Aral Sea Basin and GEF Projects.....	59
3.3. ICWC of Central Asia.....	62
3.3.1. ICWC meetings.....	62
3.3.2. Activities of ICWC Executive Bodies in 2019	64
3.4. ICSD of Central Asia.....	71
3.4.1. ICSD meetings.....	71

3.4.2. Activity of ICSD in 2019	72
3.5. Regional Environmental Center for Central Asia	73
Section 4. Bilateral Water Cooperation Between the Countries of Central Asia	79
4.1. Kazakhstan – Kyrgyzstan	80
4.2. Kazakhstan – Turkmenistan	80
4.3. Kazakhstan – Tajikistan	81
4.4. Kazakhstan – Uzbekistan	81
4.5. Kyrgyzstan – Tajikistan	81
4.6. Kyrgyzstan – Turkmenistan	82
4.7. Kyrgyzstan – Uzbekistan	82
4.8. Tajikistan – Turkmenistan	82
4.9. Tajikistan – Uzbekistan	83
4.10. Turkmenistan – Uzbekistan	85
Section 5. Key Water Developments in the Countries of Central Asia	87
5.1. Kazakhstan	88
5.2. Kyrgyz Republic	96
5.3. Tajikistan	104
5.4. Turkmenistan	112
5.5. Uzbekistan	121
Section 6. United Nations and its Specialized Agencies	137
6.1. General Assembly	138
6.2. Security Council	144
6.3. Secretariat	146
6.4. United Nations Development Program	146
6.5. UN Water	152
6.6. UN Economic Commission for Europe	152
6.7. Economic and Social Commission for Asia and the Pacific	155
6.8. United Nations Regional Centre for Preventive Diplomacy for Central Asia	155

6.9. World Meteorological Organization	157
6.10. International Fund for Agricultural Development	158
6.11. United Nations Educational, Scientific and Cultural Organization	158
6.12. Food and Agriculture Organization	159
6.13. United Nations Environment Program	163
6.14. International Law Commission	165
6.15. International Court of Justice	165
Section 7. International Water Organizations and Initiatives	167
7.1. Asia Water Council	168
7.2. Geneva Water Hub	168
7.3. Global Water Partnership	169
7.4. International Commission on Irrigation and Drainage	171
7.5. International Network of Basin Organizations	172
7.6. International Water Resources Association and World Water Congress	174
7.7. OIC Water Council	175
7.8. Stockholm International Water Institute and World Water Week	176
7.9. World Water Council	177
Section 8. Activities of International Partners in Central Asia	181
8.1. Asian Development Bank	182
8.2. Asian Infrastructure Investment Bank	183
8.3. European Bank for Reconstruction and Development	183
8.4. European Union	185
8.5. German Society for International Cooperation	186
8.6. Organization for Economic Cooperation and Development	187
8.7. Organization for Security and Co-operation in Europe	188
8.8. Swiss Confederation (SDC and SECO)	189
8.9. United States Agency for International Development	190
8.10. World Bank	191

Section 9. Water Education	195
9.1. Higher Education Institutions (HEIs) and Professional Development Centers	196
9.1.1. Kazakhstan	196
9.1.2. Kyrgyz Republic	201
9.1.3. Tajikistan	204
9.1.4. Turkmenistan	205
9.1.5. Uzbekistan	206
9.2. Regional HEIs and Professional Development Centers	211
9.2.1. Regional Training Center at SIC ICWC	211
9.2.2. University of Central Asia (Kazakhstan, Kyrgyzstan, and Tajikistan)	212
9.3. Professional Development Courses and Trainings	213
9.3.1. Professional Development Courses and Trainings in 2019	213
9.3.2. Professional Development Courses and Trainings in 2020	214
Section 10. Science and Innovations	217
10.1. Innovations in 2019	218
10.2. Central Asia Expert Platform on Water Security, Sustainable Development, and Future Studies	222
10.3. Leading research institutes of EECCA countries	223
10.4. International Research Institutes Working on Water Issues in Central Asia	228
Section 11. Key Water Developments in the World	231
11.1. Africa	232
11.2. Asia	235
11.3. America	246
11.4. Australia and Oceania	248
11.5. Europe	250
11.5.1. Western and Southern Europe	250
11.5.2. Eastern Europe and Caucasus	252
11.6. Middle East	259
Section 12. Thematic Reviews	263

12.1. Climate Change	264
12.2. Sustainable Development Goals: Tracking the Progress	271
12.3. Earth Overshoot Day 2019	274
12.4. Biodiversity: Key trends and events in 2019	275
12.5. Mountains	283
12.6. Diagnostic Report on Rational Use of Water Resources in Central Asia as of 2019: Summary	285
Section 13. Publications in 2019	297
Section 14. Central Asia Awards in Water-related fields	307
Section 15. Global Risks 2020	313
Section 16. 2020 Calendar of Events	319

List of Abbreviations

ACN	Academic Community Network
ADB	Asian Development Bank
AIB	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

The 2019 edition of the Water Yearbook: Central Asia and around the Globe was prepared during the pandemic and the lockdown period. Within weeks humanity found itself in a deep isolation and even more felt the fragility and interdependence of this world. We have yet to assess the effects of COVID-19 on the environment. But it is already clear that, on the one side, the nature takes some break from anthropogenic activities but, on the other side, the pandemic-induced economic recession most likely slow down the development of green technologies, renewable energy as well as systemic (rather than ad hoc) lowering of environmental load. All-round isolation elucidates the paramount importance of online information flows that can partially fill the gap in face-to-face contacts and spur new creative ideas and accomplishments. We hope that the Water Yearbook will have its contribution too.



Let's go back to the past, in 2019, to those key developments and events that are highlighted in this Yearbook.

Regional cooperation has continued to intensify in Central Asia. The President of Kazakhstan Kassym-Jomart Tokayev paid the state visit to Uzbekistan on 14-15 April, whereas on 26-27 July, for the first time in history of Kyrgyz-Tajik relations, the Presidents of Kyrgyzstan and Tajikistan met at the borderline between the two states. The authorized agencies of Tajikistan and Uzbekistan negotiated about joint construction of HPP on the Zeravshan River ("[Bilateral Water Cooperation between the States in Central Asia](#)").

In late 2019, the results of Turkmenistan's three-year chairmanship in the International Fund for Saving the Aral Sea were summarized and the chairmanship has been passed to Tajikistan. ICWC held two meetings: 76th (April 19) in Tashkent and 77th (November 5) in Almaty. As a result of re-organization, S.N. Gromov, Vice-minister of Ecology, Geology and Natural Resources was assigned as the new ICWC member from Kazakhstan. Tajikistan was represented by U.Yu. Usmonzoda, Minister of Energy and Water Resources instead of the First Deputy Minister S.N. Rakhimzoda, who was assigned the Ambassador of Tajikistan in India. As a result of reformation of the Turkmenistan's Ministry of Agriculture and Water Management, A. Yazmyradov, the Chairman of the State Committee of Water Management has become an ICWC member at the beginning of the year ("[IFAS and Other Regional Organizations in Central Asia](#)"). ICWC members and bodies strengthened their efforts for better coordination of regional and national bodies but this has not yet been mirrored in formal protocols of the Commission's meetings.

From September 20 to October 20, SIC ICWC together with the International Innovation Center of the Aral Sea Region undertook the first field expedition from two planned ones (for 2019-2020) to the exposed bed of the Aral Sea. This expedition was a result of a whole host of expectations and governmental decisions on continuation of the exposed seabed monitoring conducted by SIC ICWC during 2005-2011 with the German government's support. The current expedition was supported as part of a UNDP project through the funds of the UN Multi-Partner Human Security Trust Fund for the Aral Sea region. First results of the monitoring are described in "[Water Management Situation in the Aral Sea Basin](#)".

The information on topical water-related events all over the continents is collected in "[Key Water Developments in the World](#)".

"[Thematic Reviews](#)" present the information on climate change, mountains (new subsection) and the detailed overview of biodiversity in the world based on the most recent assessments. Subsection on SDGs illustrates science's contribution to achieving sustainable development. Scientists believe that despite considerable efforts, we are not on track to achieve the SDGs by 2030.

As a regional thematic review, the Yearbook presents the key messages and findings of the "[Diagnostic Report on Rational Use of Water Resources in Central Asia as of 2019](#)". The Report was commissioned by OECD and prepared by SIC ICWC, with contributions from leading experts from the CA countries and the financial support from Germany. This Diagnostic Report has got positive feedback from national and international institutions.

Section "[Science and Innovations](#)" was considerably extended by new information on the Central Asia Expert Platform on Water Security, Sustainable Development, and Future Studies, the leading research institutions in EECCA countries, as well as on international research institutes working on water issues in Central Asia. The establishment of the Expert Platform seeks to put into practice a proposal of the President of Uzbekistan Sh.M. Mirziyoyev voiced at the IFAS summit in Turkmenbashi in 2018.

In its final sections, the Yearbook contains information about key publications, Central Asia water awards, risks in 2020 and the calendar of events for 2020.

The last but not the least the authors appreciate all contributions made to this edition of the Yearbook in response to our request for information. Special thanks are due to the United Nations Regional Center for Preventive Diplomacy for Central Asia as well as to Organization for Security and Co-operation in Europe Project Co-ordinator in Uzbekistan for their financial support.

Professor Viktor A. Dukhovniy





Section 1

2019 Calendar
of Events

January

- **3 January** – Field session of the International Press Club “Uzbekistan-24” – afforestation of the dried bed of the Aral Sea, Muynak – Surgul, Uzbekistan
- **16-18 January** – 9th International Micro Irrigation Conference, Aurangabad, India
- **24-25 January** – 6th High Level Conference “European Union - Central Asia: Priorities for Environment and Water Resources Cooperation”, Tashkent, Uzbekistan
- **29-31 January** – Twenty-fourth session of the UNECE Committee on Environmental Policy, Geneva, Switzerland

February

- **5-6 February** – 2nd International Forum “Uzbekistan 2035”, Tashkent, Uzbekistan
- **5-7 February** – Meetings of the Parties to the Espoo Convention and to the Protocol on SEA, intermediary sessions, Geneva, Switzerland
- **19-20 February** – International Conference “Connectivity in Central Asia: Challenges and New Opportunities”, Tashkent, Uzbekistan
- **21-22 February** – 3rd International Conference on Climate Change, Kuala Lumpur, Malaysia
- **21-22 February** – Seminar “The Principle of No Significant Harm – What Implications for Water Diplomacy?”, Hague, Netherlands
- **27-28 February** – Twenty-eighth meeting of the Bureau of the Water Convention, Geneva, Switzerland

March

- **7-9 March** – Women and Rivers Congress, Nagarkot, Nepal
- **8-9 March** – International Conference on Climate Change Adaptation and Multidisciplinary Issues, Taipei, Taiwan
- **8-10 March** – International Conference on Advances in Water and Wastewater Treatment Technology, Shenzhen, China
- **11-15 March** – Fourth session of the UN Environment Assembly, Nairobi, Kenya
- **14 March** – International Day of Action for Rivers
- **14-15 March** – 3rd General Assembly of the Asian Water Council, Makati City, Philippines
- **21-22 March** – Regional Forum on Sustainable Development for the UNECE region, Geneva, Switzerland
- **22 March** – World Water Day
- **26 March** – Aral Sea Day
- **27 March** – Sixth Asia-Pacific Forum on Sustainable Development, Bangkok, Thailand

April

- **3-4 April** – Central Asia Climate Change Conference, Tashkent, Uzbekistan
- **16-17 April** – International Scientific and Practical Seminar “Ecosystem and Water Resources of the Aral Sea Basin”, Nukus, Uzbekistan
- **19 April** – 76th meeting of ICWC, Tashkent, Uzbekistan
- **25-27 April** – Second Belt and Road Forum for International Cooperation, Beijing, China
- **29-30 April** – Global Workshop on Ecosystem-based Adaptation in Transboundary Basins, Water Convention, Geneva, Switzerland

May

- **1 May** – 10th meeting of the Task Force on Water and Climate, Geneva, Switzerland
- **7-9 May** – International Conference on Sustainable Water Resources Management, Alicante, Spain
- **8 May** – Foundation laying ceremony of a new settlement near Turkmen Lake “Altyn Asyr”, Turkmenistan
- **13-14 May** – UNESCO International Water Conference, Paris, France
- **14-16 May** – World Hydropower Congress, Paris, France
- **22 May** – International Day for Biological Diversity
- **27-31 May** – 75th session of ESCAP, Bangkok, Thailand

June

- **5 June** – World Environment Day (Ecologist's Day)
- **5 June** – International Conference on the “Role of Water Diplomacy in Achieving the Sustainable Development in Central Asia”, Ashgabat, Turkmenistan
- **5-11 June** – 2nd Baku International Water Week, Baku, Azerbaijan
- **6-7 June** – Singapore International Water Week, Singapore
- **16-20 June** – 12th IWA International Conference on Water Reclamation and Reuse, Berlin, Germany
- **17-20 June** – 17th “Europe-INBO 2019” International Conference for the Implementation of the European Water Directives, Lahti, Finland
- **24-26 June** – All-Russian Water Congress, Moscow, Russia
- **26 June** – CAREC meeting “Promoting Water Cooperation and Experience Exchange: Initiating Discussions”, Tashkent, Uzbekistan
- **26 June** – Video-conference of the GWP for Central Asia and Caucasus, Tashkent, Uzbekistan
- **26-27 June** – Water Leaders Summit, Milwaukee, USA

July

- **5-6 July** – EU-Central Asia Forum, Bishkek, Kyrgyzstan
- **8 July** – International Conference “Innovative Approaches to Solving Global Environmental Problems: World Experience (the Aral Sea case study)”, Tashkent, Uzbekistan
- **8-10 July** – European/CIS Regional Ministerial Conference on Green Economy, Tashkent, Uzbekistan
- **9-18 July** – High-level Political Forum on Sustainable Development, New York, USA
- **22-24 July** – 5th International Congress on Water, Waste and Energy Management, Paris, France
- **29 July** – Earth Overshoot Day
- **30-31 July** – 2nd meeting of the Regional Working Group on Development of the Aral Sea Basin Program (ASBP-4) and on Improvement of Institutional and Legal Framework of IFAS, Ashgabat, Turkmenistan

August

- **11-12 August** – First Caspian Economic Forum, Ashgabat, Turkmenistan
- **12 August** – Day of the Caspian Sea
- **25-30 August** – World Water Week, Stockholm, Sweden

September

- **1-7 September** – 3rd World Irrigation Forum & 70th International Executive Council (IEC), ICID, Bali Indonesia
- **2-13 September** – Fourteenth session of the Conference of the Parties to the UN Convention to Combat Desertification (UNCCD COP 14), New Dehli, India
- **4-7 September** – Korea International Water Week, Daegu, Republic of Korea
- **5-6 September** – Second Central Asian Expert Forum “Dialogue on Water Issues in Central Asia: From the National to the Regional Levels”, Nur-Sultan and Burabay, Kazakhstan
- **16-18 September** – International Conference “Water Security: New Technologies, Strategies, Policies and Institutions”, Beijing, China
- **17 September** – Opening of the 74th Session of the UNGA, New York, USA
- **23 September** – UN Climate Action Summit, New York, USA
- **23-24 September** – International Conference of EECCA NWO “Science and Innovations for Water Security”, Yekaterinburg, Russia
- **23-27 September** – XV International Scientific-Practical Symposium/Exhibition “Clean Water of Russia 2019”, Yekaterinburg, Russia
- **30 September-3 October** – 11th INBO World General Assembly, Marrakesh, Morocco

October

- **2 October** – 23rd Session of the Working Group on Water, Energy and Environment, Tashkent, Uzbekistan
- **2-4 October** – 5th International Conference on Water and Society, Valencia, Spain
- **15 October** – International Day of Rural Women
- **15-17 October** – Budapest Water Summit, Budapest, Hungary
- **17-22 October** – First International Environmental Marathon “ARAL MARATHON”, Tashkent – Samarkand – Bukhara – Urgench – Nukus – Muynak, Uzbekistan
- **18 October** – Water as a Catalyst of Regional Cooperation in Central Asia - Workshop on Water, Energy and Environmental Cooperation in Central Asia, Budapest, Hungary
- **21 October** – First meeting of the Expert Group on the Transboundary Water Allocation Handbook, Geneva, Switzerland
- **22-23 October** – Consultative Workshop on Improving Services related to Climate Information and Early Warning for Resilience, Beijing, China
- **22-24 October** – Fifteenth meeting of the Working Group on Integrated Water Resources Management under the UNECE Water Convention, Geneva, Switzerland
- **23 October** – Meeting of the ICSD's Working Group, Nukus, Uzbekistan
- **24 October** – Meeting of ICSD, Nukus, Uzbekistan
- **24 October** – Regional Meeting of Water Agencies, Nukus, Uzbekistan
- **24-25 October** – International High-Level Conference under UN Auspices “Aral Sea Region – a Zone of Environmental Innovations and Technologies”, Nukus, Uzbekistan
- **28-30 October** – Conference on Water Security and Climate Change, San Luis Potosi, Mexico
- **28-30 October** – Forum on Rural Development and Food Security, Manila, Philippines

November

- **5 November** – 77th meeting of ICWC, Almaty, Kazakhstan
- **5-6 November** – International Conference "Rational Use of Water Resources – the Basis for Achieving Sustainable Development Goals", Ashgabat, Turkmenistan
- **11-12 November** – 3rd Annual Congress on Soil, Plant and Water Sciences, Madrid, Spain
- **14-15 November** – Regional workshop “Use of Innovative Technologies for Sustainable Water Management in Central Asia”, Ashgabat, Turkmenistan
- **18-21 November** – SPECA Days, Ashgabat, Turkmenistan
- **25-26 November** – 3rd Meeting of the Regional Working Group on Development of ASBP-4 and on Final Improvement of Institutional and Legal Framework of IFAS, Ashgabat, Turkmenistan
- **29 November** – Second Consultative Meeting of the Heads of Central Asian States, Tashkent, Uzbekistan

December

- **2-3 December** – Meeting of the Implementation Committee of the UNECE Water Convention, Geneva, Switzerland
- **2-13 December** – 25th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 25), Madrid, Spain
- **4 December** – Conference “Implementation of International Water Law: Global, Regional and Basin Perspectives”, Geneva, Switzerland
- **4-5 December** – Global Workshop on Exchange of Data and Information in Transboundary Basins under the UNECE Water Convention, Geneva, Switzerland
- **6 December** – Fifteenth meeting of the Working Group on Monitoring and Assessment under the UNECE Water Convention, Geneva, Switzerland
- **18-19 December** – Regional Central Asian Conference on “Innovative Approaches and Solutions in the System of Sustainable Water Resources Management and Opportunities for their Use in Central Asia”, Almaty, Kazakhstan

Major Events in Central Asia

Central Asia Climate Change Conference, 3-4 April, Tashkent



The Central Asia Climate Change Conference (CACCC-2019) was organized within the framework of the Climate Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB)¹ with the support of WB, EC-IFAS, UzHydromet, and CAREC.

The main objective of the Conference is to promote regional cooperation and partnership on climate adaptation and mitigation in Central Asia.

The Conference brought together 390 representatives of Central Asian governments, international and regional organizations, diplomatic missions,

multilateral development banks and civil society organizations, as well as leading experts in the field of climate change, young leaders and representatives of the environmental sector.

Three pre-conference sessions were organized on April 2:

(1) the first session focused on building scientific and professional capacities for effective water resource management and climate actions. It discussed current gaps and needs for developing research and academic capacities, the ways for cooperation between national academic partners of the region and with international scientific institutions;

(2) the second session focused on informing about the up-to-date progress in implementation of local climate investment initiatives and establishment of new partnership to scale-up and replicate successful practices and technologies in energy, agriculture and water sectors;

(3) the third session “One planet – one future ... Empowering youth for climate actions” mobilized youth voices for climate change action.

The results of pre-conference sessions were presented at the plenary sessions of the Conference.

¹ The first Conference of the project was organized on January 24-25, 2018 in the city of Almaty, Kazakhstan. The findings of the CACCC-2018 are elaborated into key messages and formulated the thematic content for the CACCC-2019 program

The Conference was divided into five Plenary Sessions on: (1) Global climate policy and national commitments (2) Climate change impacts and adaptation in global and regional context (3) Climate services (4) Climate technologies and practices (5) Climate finance.

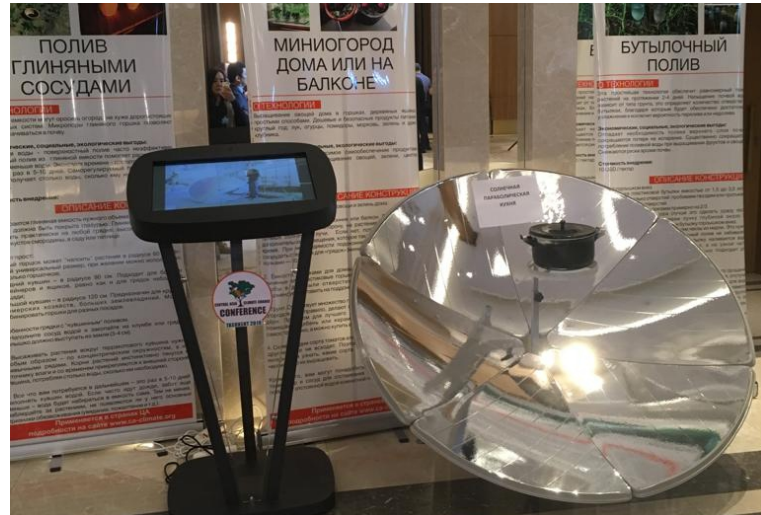
Furthermore, five parallel sessions were conducted: (a) knowledge platforms and communication on climate change; (b) integrated natural resources management approaches in Central Asia; (c) science and evidence-based water and land management solutions for strengthening climate resilience in Central Asia; (d) regional environment protection for sustainable development in the context of climate change; and (e) the role of civil society and private sector in activating climate actions in Central Asia.

During the Conference, an exhibition was organized to demonstrate low-cost climate-resilient technologies, videos and practical guides to their production. The participants got acquainted with the most widespread technologies of water supply systems, water conservation, alternative energy sources and rational land use.

At the end of the Conference, a final [“call for action”](#) document was adopted that promotes regional cooperation and joint implementation of measures to adapt to climate change and mitigate its effects. This paper calls for regional efforts to bring attention to the issue of climate change; making immediate, science-based decisions in the management of energy, industrial, land, transport and urban systems; revision of the quantitative obligations of the Central Asian countries to the UNFCCC by increasing them, etc.

[A Climate Network of Public Organizations of Central Asia](#) is an important outcome of the Conference to actively involve the public in the process of implementing regional and national

climate change priorities and policies. It is an informal, voluntary association of national network organizations of civil society in Central Asia: EcoForum of Kazakhstan, the Climate Network of Kyrgyzstan, the TajCN Climate Network of Tajikistan, the Society for the Conservation of Nature of Turkmenistan, and the Ecological Movement of Uzbekistan. Within the framework of the post-conference session, a Memorandum of Cooperation was signed, and a joint action plan at the regional and national levels was developed (5 April, Tashkent).



International High-Level Conference “Aral Sea Region – a Zone of Environmental Innovation and Technology”, 24-25 October, Nukus

The [International High-Level Conference](#) under the auspices of UN – “Aral Sea Region – Zone of Environmental Innovation and Technology” – was held as part of the implementation of initiatives and proposals voiced by the President of the Republic of Uzbekistan at the Summit of the Heads of the IFAS Founder-States.

The goal of the Conference was to create favorable conditions for foreign investments in

the development and implementation of environmentally friendly technologies and green economy principles, promotion of ecotourism, adoption of environmentally friendly, energy- and water saving technologies to contribute to food security, and prevention of desertification and environmental migration.

More than 200 experts and analysts from Central Asian, European, American and Asian

countries, official representatives of UN and its special agencies, leading international organizations and financing institutions attended the Conference.

The Conference included the plenary session entitled “The results of joint efforts in overcoming the Aral crisis” and parallel sessions on the following topics: (1) enabling conditions for foreign investments in the development and implementation of environmentally friendly technologies; (2) promotion of green economy principles, environmentally friendly, energy- and water-saving technologies; (3) water-saving technologies and food security; (4) prevention of desertification, environmental migration and development of ecotourism.

The participants discussed drafts of the following documents: Concept “Aral Sea Region – Zone of Environmental Innovation and Technology”; special resolution of the UN Gene-

ral Assembly on declaring the Aral Sea region a zone of environmental innovation and technology; and, Regional Program on the rational water use in Central Asia.

The regular meeting of ICSD was also held as part of the Conference. In this meeting, the ICSD chairmanship was transferred from Turkmenistan to Uzbekistan, Regional Environmental Program for Sustainable Development in Central Asia was adopted, and a Memorandum of Understanding was signed by UNECE and ICSD (see “[ICSD of Central Asia](#)”).

The conference participants visited Mynak, Ship Cemetery on the dried bed of the Aral Sea, Nukus, and the Karakalpakstan State Museum of Arts named after I.V.Savitsky and were presented the exposition of current green technologies and on-going projects on mitigation of the Aral Sea disaster.

The First Deputy Prime Minister of Uzbekistan Mr. Ochilbay Ramatov opened the Conference and read out the message of the President Shavkat Mirziyoyev:

“It is impossible to restore the Aral Sea. Therefore, our task is to reduce the negative impact of the Aral Sea crisis on the environment and people’s livelihoods in the region. We propose turning the Aral Sea region into a zone of environmental innovations and technologies”.

In his video message to the Conference participants, the UN Secretary General António Guterres underlined:

“I recall the shock I experienced when I visited Aral Sea region in 2017. The effects of the crisis have been disastrous for the environment, the fishing industry, agriculture, and human health. Progress is possible, as we can see in the region”.

Helena Fraser, the UN Resident Coordinator in Uzbekistan, stressed that despite the catastrophic consequences of the Aral Sea crisis, the Aralkum desert needs to be transformed into an attractive economic zone.

“We should not talk about tragedy, but about the development in this region. Focus on human resources”, – she urged.



Following the International Conference:

- a package of priority investment projects for implementation of environmental innovations and technologies has been formed;
- proposals have been presented for inclusion in the reviewed drafts of Concept, special UN General Assembly Resolution, and Regional Program;
- the Communiqué has been adopted.

The Communiqué underlines that the Conference participants:

- "...supported the establishment of the UN Multi-Partner Human Security Trust Fund for the Aral Sea Region in Uzbekistan...;
- stressed the great importance of the establishment of the International Innovation Center for the Aral Sea Basin under the President of the Republic of Uzbekistan...;
- supported the initiative of the President of Uzbekistan to declare the Aral Sea region a zone of environmental innovation and technologies...;
- welcomed the proposal of the Republic of Uzbekistan to adopt the special UN Ge-

neral Assembly Resolution on declaring the Aral Sea region a zone of environmental innovation and technologies;

- ...emphasized the importance of enhancement of international cooperation for promotion of target projects on mitigation of negative consequences of the Aral Sea catastrophe and socio-economic improvement in the Aral Sea region...".

In the course of the Conference, the UN Resident Coordinator in Uzbekistan Ms. Helena Fraser and the Chairman of Goskomecology (State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection) Mr. Bakhrom Kuchkarov launched the nation-wide 5-year campaign to plant million trees initiated by FAO, Goskomecology, Goskomles (State Committee of the Republic of Uzbekistan on Forestry), and the Ministry of Agriculture in Uzbekistan.

On the eve of the Aral Conference, the international ecological marathon – "[ARAL MARATHON](#)" – was organized under the motto "We are responsible for the future!" (17-22 October, 6 cities in Uzbekistan: Tashkent, Samarkand, Bukhara, Urgench, Nukus and Muynak). A cup with a symbolic drop of water from Tashkent was passed from one city to another to reach the Aral Sea region. It is planned to organized the Aral Marathon annually.



Regional Central Asian Conference “Innovative Approaches and Solutions in the System of Sustainable Water Resources Management and Opportunities for Their Use in Central Asia”, 18-19 December, Almaty

The [Regional Central Asian Conference](#) was organized by the Executive Board of the International Fund for Saving the Aral Sea in the Republic of Kazakhstan together with the United Nations Development Program in Kazakhstan.

The Conference was aimed to form a platform of project proposals for further investment and applied solutions to improve the welfare of the population in Central Asia through the development of regional dialogue, exchange of experience and study of modern methods, technologies and systems.

The Conference brought together representatives of interested ministries and agencies of the Central Asian countries, scientists, experts, UN structural units, international organizations and financing institutions, researchers and academia.

The Conference was organized around 7 sessions: (i) inter-basin water transfers as one of methods for water augmentation; (ii) low-pressure small hydropower stations as a guarantor of the protection of river ecosystems; (iii) restoration and reconstruction of river valleys as a way to improve river water quantity and quality; (iv) modern methods of water conservation and balancing; (v) methods and prospects of using geothermal and industrial groundwater; (vi) new methods for local drainage systems in small towns and rural communities; and (vii) innovative adaptation practices for water conservation, drainage and application of remote sensing.

Presentation of the [UN Special Program](#) for the Aral Sea Basin (UN SPAS) was held as part of the Conference. The participants saw the video demonstrating the main steps planned by Turkmenistan in the preparation of multilateral consultations in the UN-IFAS format and launching a pilot project of UN SPAS.

The Conference provided a platform for regional dialogue on sustainable water resource management, sharing knowledge and experience in innovative approaches and solutions. The participants have laid a foundation for new projects to address pressing water and environmental problems in the region. As a result, recommendations have been drafted:

“...For the achievement of SDGs in Central Asia, consolidation of research and production potential, integration of scientific communities

and water management organizations, and mutually beneficial cooperation between the leading national economic sectors are needed”.

“...The Conference considers it necessary to continue joint work in the field of: provision of access to clean drinking water for rural population; integrated water and energy management; increased use of renewable energy and geothermal water; automated water monitoring and water conservation; reduction of water pollution; preservation of aquatic and water-related ecosystems; mitigation of land degradation; afforestation; reduction of disaster risks, including floods, mudflow, droughts, sandstorms, and salt and dust movement from the dried Aral Sea bed”.

“...The Conference considers it necessary to submit the RECOMMENDATIONS developed by the Central Asian Regional Conference ... for information to the Board Members of the International Fund for Saving the Aral Sea”.

Regional Central Asian Conference on the topic:
«Иновационные подходы и решения в системе устойчивого управления водными ресурсами и возможности их использования в условиях Центральной Азии»







Section 2

Water Management Situation in the Aral Sea Basin

2.1. Water Management Situation in the Amu Darya and the Syr Darya basins

Water Resources

In 2019, the total annual flow in the basins of the Amu Darya and the Syr Darya was 109.1 km³ or 93% of average annual flow.

Amu Darya Basin

The annual flow in the basin, including the Amu Darya and its tributaries, as well as the Zarafshan River, was 74.6 km³, of which 60.31 km³ in the Amu Darya (at the nominal Kerki section located upstream of the Garagumdarya River). The water content of the Amu Darya in this monitoring section was: 105.5% of the norm in the first quarter; 101% in the growing season; and, 66.7% in the first half of the non-growing season 2019-2020.

As of the 1st of January 2019, the total water storage in the Nurek and Tuyamuyun reservoirs was 11.988 km³.

Syr Darya Basin

The annual flow in the basin, including the Naryn, Karadarya, and Chirchik and small rivers, amounted to 34.5 km³, of which 21.64 km³ of the inflow to three reservoirs – Toktogul, Andizhan, and Charvak – along the Syr Darya.

As of the 1st of January 2019, the total water storage by reservoirs in the basin was 24.98 km³, including 18.664 km³ in the key reservoirs in the flow formation zone.

Operation of Reservoir Hydrosystems

The annual inflow to the Nurek reservoir was 21.64 km³, including 17.44 km³ (81%) – over the growing season. Water releases from the reservoir were in the amount of 21.44 km³/year, of which 13.61 km³ or 63% of annual flow was discharged during the growing season.

Because of lower flow along the Panj River, the annual inflow to the Tuyamuyun reservoir was 30 km³. This was 0.79 km³ lower than the forecast, including by 1.9 km³ lower for the growing season. Annual water releases from the reservoir were 28.68 km³ or 96% of the value set in the schedule of the BWO Amu Darya. Water releases amounted to 20.06 km³ or 70% during the growing season.

The annual inflow to the Toktogul reservoir located on the Naryn River was 11.97 km³, of which

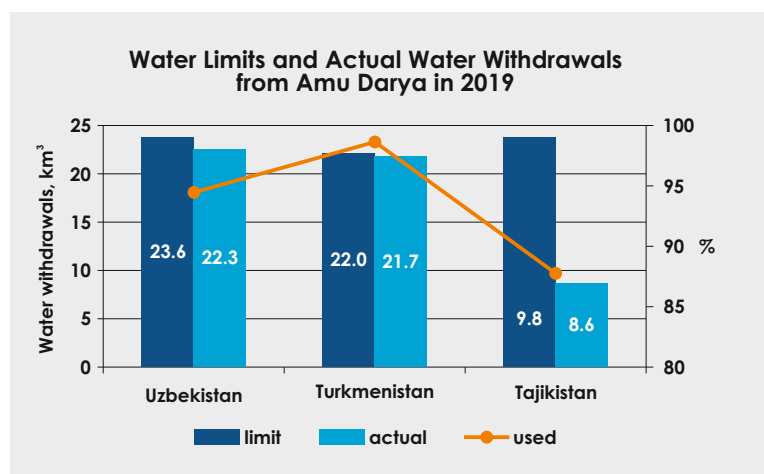
8.81 km³ (74%) – during the growing season. Annual water releases from the reservoir amounted to 13.777 km³ and only 5.14 km³ (37%) were discharged from the reservoir during the growing season. Such re-distribution of flow allowed filling the Toktogul reservoir from 13.6 to 17.2 km³ during the growing season.

Water Allocation and Shortage

Amu Darya Basin

In 2019, given the established limit of water withdrawal from the Amu Darya at 55.4 km³, actually 52.6 km³ were diverted, including 36.12 km³ during the growing season. 95% of annual water limit was used, of which 91% of the established limit of water withdrawal into canals at 39.67 km³ – during the growing season. The following situation was observed by countries:

- **Tajikistan** – given the water limit of 9.81 km³, the actual water withdrawal was 8.61 km³ or 87.8%;
- **Turkmenistan** – given the water limit of 22.02 km³, the actual water withdrawal was 21.71 km³ or 98.6%;
- **Uzbekistan** – given the water limit of 23.59 km³, the actual water withdrawal was 22.3 km³ or 94.5%.



During the growing season, in the reach from the Nurek HPP to the Tuyamuyun reservoir the water shortage was estimated at 14% in Tajikistan and 5% and 10% in Turkmenistan and Uzbekistan, respectively. In the reach from the Tuyamuyun hydrosystem to the Samanbay post,

Turkmenistan and Uzbekistan has received by 4% and 5% less water, respectively, than they required during the growing season.

Syr Darya Basin

The total water withdrawal in the Syr Darya was 12 km³, including 8.96 km³ or 76% of the established limit at 11.869 km³ on water intake to canals during the growing season. 0.548 km³ of water were discharged from the Syr Darya into Arnasay. The water allocation plan of BWO Syr Darya was on average fulfilled by 79%. In the reach from the Toktogul reservoir to the Chardara reservoir, the water shortage was estimated at 18% in Tajikistan, 33% in Kyrgyzstan, and 34% and 25% in Kazakhstan and Uzbekistan, respectively.

Inflow to the Aral Sea Region

According to the data of the Kazakhstan’s Committee for Water Resources, in 2019, inflow into the Northern Aral Sea from the Syr Darya was 3.697 km³, and 0.83 km³ were discharged from the Northern Sea into the Large Aral Sea (Eastern part).

Based on SIC’s estimates, the South Aral region should receive 8 km³ of water from the Amu Darya in wet years (in terms of flow) and 3.5 km³ in dry years. Actually in 2019, 3.21 km³ or

40% of 8 km³ was delivered to the South Aral region.

River Channel Water Balance Discrepancies

In 2019, relative lowering of balance discrepancies along the Amu Darya River was observed: 4.45 km³ during the growing season and 2.1 km³ during the non-growing season or 6.55 km³ in total.

Balance discrepancies along the Syr Darya were estimated at 4.59 km³ (0.87 km³ during the growing season and 3.72 km³ during the non-growing season, i.e. decreased by 11% as compared to the previous year (5.17 km³).

Meeting Demands

The table below shows how water demands were met among the CA countries.

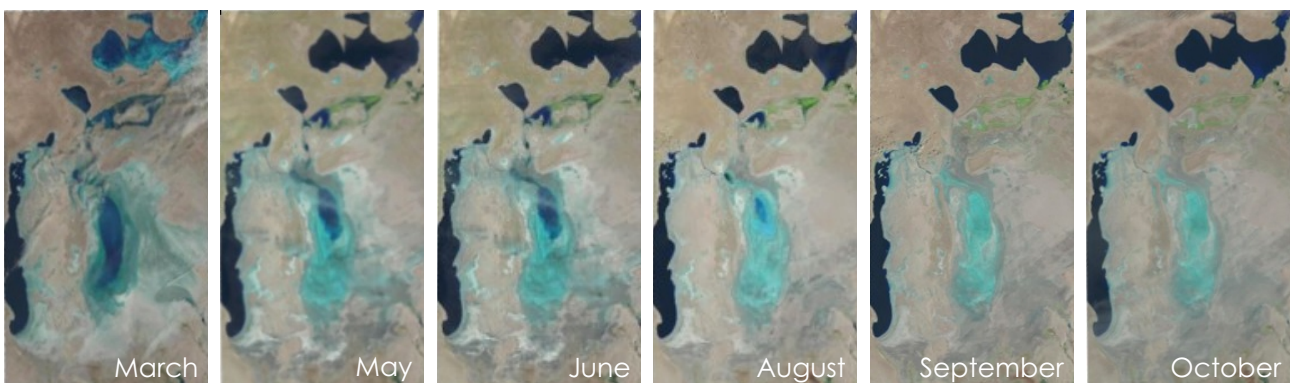
CA Countries	Meeting water demands in growing season, %	
	Amu Darya	Syr Darya
Kazakhstan	–	66
Kyrgyzstan	–	67
Tajikistan	86	82
Turkmenistan	95	–
Uzbekistan	90	75

2.2. Monitoring of Changes in the Water Surface Area of the Large Aral Sea and the Amu Darya Delta

In 2019, SIC ICWC continued monitoring of changes in the water surface area of the Eastern and Western parts of the Large Aral Sea (LAS) as well as lake systems of the Amu Darya

delta through Landsat 8 OLI images (www.cawater-info.net/aral/data/monitoring_amu.htm).

Figure 1. Satellite images of Western and Eastern parts of the Large Aral Sea, Landsat 8 OLI (2019)



New methodology. Since 2019, SIC ICWC has been applying a new improved methodology for interpretation of satellite imagery by using the AWEI indexes (Automated Water Extraction Index) for classification of the sea's water surface. Since 2012 to 2019, the satellite data on water surfaces were digitized manually, with the following comparison of NDVI (Normalized Difference Ve-

getation Index). The new methodology minimizes erroneous interpretation of an area under consideration as the water or land surface (e.g. if plants cover the water's surface). Now, water and non-water sites are classified automatically in "R" and GIS on the basis of spectral water indexes. Accordingly, there could be discrepancies in the data over previous years.

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

Water distribution along the Amu Darya

The analysis of water-related situation in the Amu Darya Basin in 2019 (on the data from BWO Amu Darya) shows that, in fact, 4.04 km³ of water (flow from the river and collecting drains)

reached the Amu Darya delta (Figures 1 and 2). This is three times more than in 2018.

Additionally, 0.828 km³ of collector-drainage water flowed towards the exposed bed of the Large Aral Sea from the Main South-Karakalpak (Right-bank) collecting drain in 2019 (Table 1).

Figure 2. Dynamics of total water supply to the Amu Darya delta in 2019, Mm³

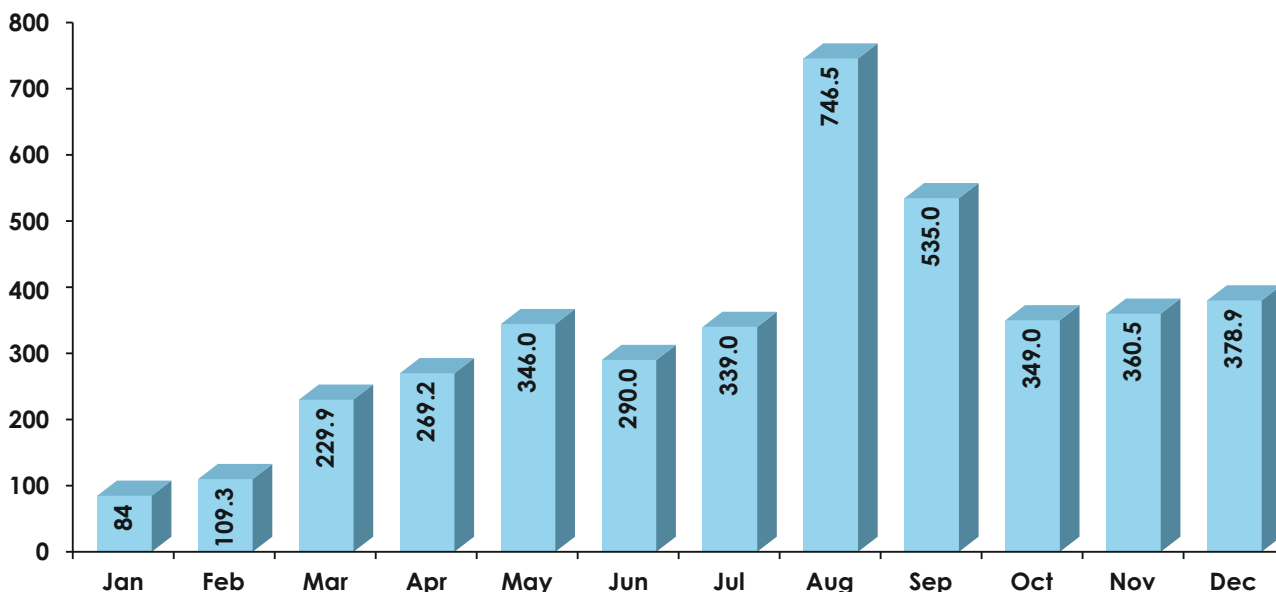


Table 1. Flow of collector-drainage water from the Main South-Karakalpak collecting drain to the exposed bed of the Large Aral Sea in 2019, Mm³

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly
22.0	27.3	72.9	112.2	108.0	101.0	98.0	79.5	84.0	71.0	44.5	7.9	828.3

Total inflow to the Large Aral Sea

As compared to 2018, in 2019, inflow to the Large Aral Sea (1) **increased** from 846 to 1217 km³ from the Amu Darya delta, including collector-drainage water from the Main South Karakalpak collecting drain; (2) **decreased** 4 times from

3.31 to 0.83 km³ from the Northern Aral Sea (NAS) (Table 2). The total amount of water discharge to LAS decreased twofold from 4.156 to 2.047 km³. Water flowing from NAS is partially accumulated in Eastern part, also reaches Western part of LAS, and is partially lost through evaporation and infiltration.

Table 2. Total inflow to LAS, Mm³

Year	Northern Aral Sea		South Aral region		Total discharge into LAS
	Total inflow to NAS from the Syr Darya, Karateren section	Discharge from NAS into LAS	Total inflow to the Amu Darya delta, Samanbay section (incl. collector-drainage water)	Discharge from the Amu Darya delta into LAS	
2018	3,009	3,310	1,715	846	4,156
2019	3,697	830	4,037	1,217	2,047

2.2.2. Dynamics of Changes in the Open Water Surface and Wetland Area of Eastern and Western Parts of the Large Aral Sea

As monitoring and GIS data shows, from March to September 2019 the water surface area in the Eastern part of LAS shrank from 725,000 to 343,000 ha (Table 3), while the area of the exposed bed **increased** by 382,000 ha (Figure 1). The

water surface area in the Western part is also unstable. It **decreased** from 356,000 to 317,000 ha in May-September (Table 3). This is connected with the almost twofold reduced discharge from NAS into LAS.

Table 3. The area of wetlands and open water surfaces in the Eastern and Western parts of the Large Aral Sea, 2019 (Landsat 8 OLI)

Month	March	May	June	August	September
Western part of the Large Aral Sea, ha					
Wetland	–	205,045	283,386	292,138	247,019
Water surface	–	356,304	277,964	269,213	317,485
Eastern part of the Large Aral Sea, ha					
Wetland	771,385	921,410	1,053,484	1,166,610	1,153,997
Water surface	725,438	575,413	443,340	330,214	342,826

2.2.3. Lake Systems of the Amu Darya Delta

The lake systems of the Amu Darya delta are represented by small local water bodies of the South Aral region.

Generally, as compared to 2018, the hydrological situation in the South Aral region improved in 2019. The open water surface area of the lake systems increased from 34,200 to 54,500 ha in March-October (Table 4).

An abrupt increase was observed in the second half of the year, when there was inflow of water to the delta (Table 4, Figure 3).

Nevertheless, the actual areas of lake systems account for 10 to 40% of the maximal design area.

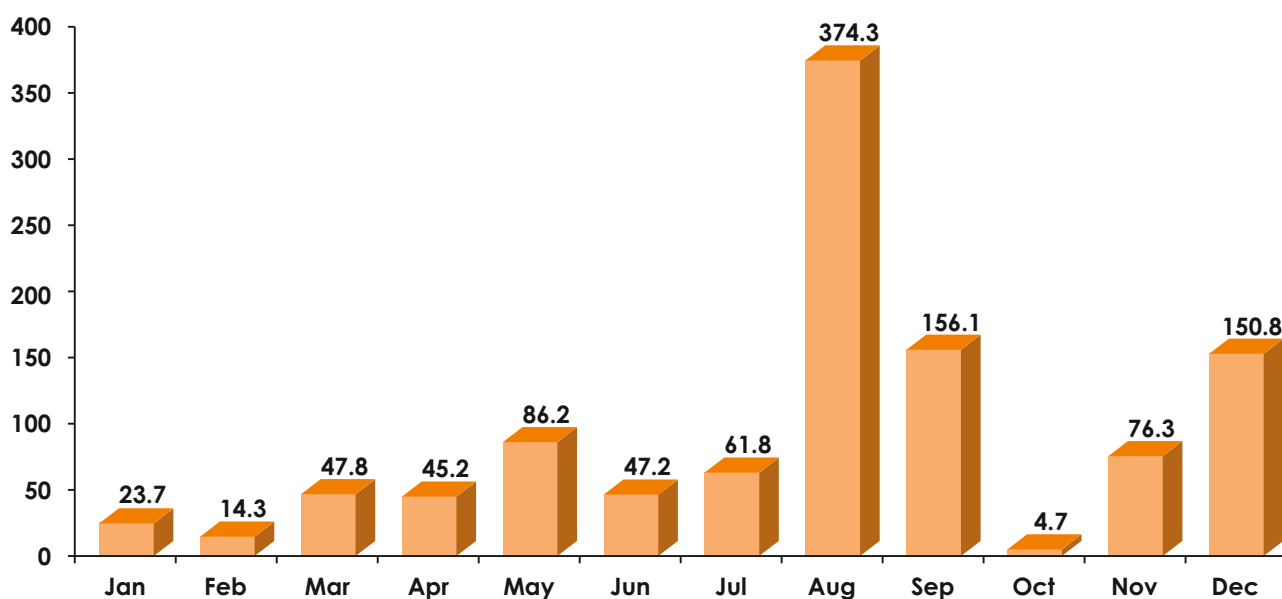
Despite the supply of 4.04 km³ to the Amu Darya delta, stability is not achieved even in those lakes that are used for fishery: Sudoche, Rybache, Muynak and Djiltirbas.

The reason is the lack of a special plan for filling of the lakes with water and the failure to control this process.

Table 4. The area of open water surface of the lake systems in South Aral region in 2019, ha

Water body	Design area	Mar 20	May 23	Jun 24	Aug 27	Sep 12	Oct 14
Sudoche	43,200	16,940	16,508	14,585	14,173	15,949	18,616
Mejdureche	32,050	3,781	5,562	4,922	13,217	11,356	14,471
Rybatche	6,240	2,641	993	2,383	3,154	2,495	4,234
Maynak	9,740	422	361	373	185	253	752
Djiltyrbas dam-terminated	35,400	6,001	5,630	5,574	3,620	7,626	7,476
Djiltyrbas (together with former right and left streams)	62,420	2,847	2,719	1,171	374	1,905	3,561
Dumalak	25,630	3	76	1	651	729	1,109
Makpalkul	4,750	863	678	815	1,509	3,109	2,469
Mashan Karadjar	2,916	544	727	608	203	824	1,338
Water surface southward of Muynak		60	–	–	–	–	97
Water surface along Kazakhdarya river channel		–	–	–	–	5	3
Zakirkol lake	2,310	128	117	96	302	449	396
TOTAL		34,229	33,372	30,526	37,389	44,701	54,522

The increased supply of river water to the delta in the second half of the year (Figure 2) contributes to higher inflow of collector-drainage water to Sudoche lake (Figure 4) from Ustyurt and Kungrad (KKC) collecting drains.

Figure 3. Inflow to Mejdureche reservoir during 2019, Mm³

The wetland area of the lake systems in South Aral region decreased slightly – from 305,000 to 285,000 ha – over March-October (Table 5).

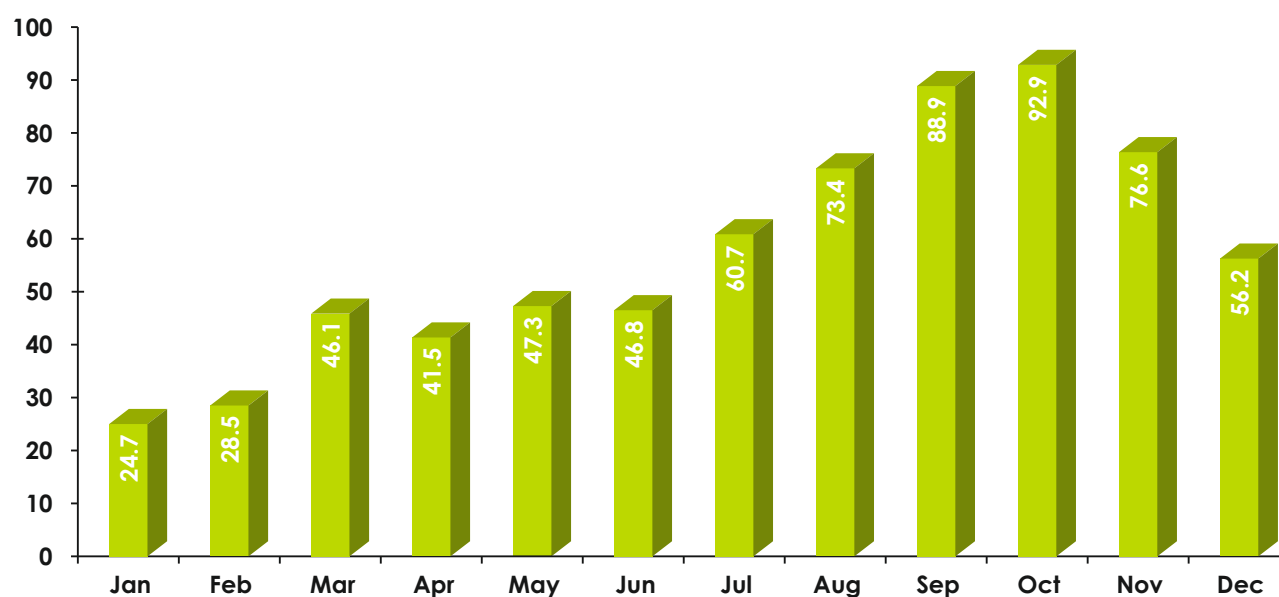
Figure 4. Collector-drainage water inflow to Sudoche lake during 2019, Mm³

Table 5. Wetland areas of lake systems in the South Aral region in 2019, ha

Water body	Mar 20	May 23	Jun 24	Aug 27	Sep 12	Oct 14
Sudoche	41,584	42,016	43,939	44,350	42,574	39,908
Mejdureche	34,003	32,222	32,863	24,567	26,232	23,313
Rybache	8,852	10,500	9,110	8,339	8,881	7,259
Maynak	15,742	15,803	15,791	15,979	15,825	15,412
Djilyrbas dam-terminated	41,472	41,842	41,899	43,851	38,917	39,997
Djilyrbas (together with former right and left streams)	96,104	96,232	97,780	98,576	96,565	95,389
Dumalak	16,047	15,974	16,049	15,398	15,281	14,941
Makpalkul	7,821	8,006	7,869	7,174	5,211	6,214
Mashan Karadjar	26,657	26,474	26,594	27,000	26,211	25,863
Water surface southward of Muynak	9,545	9,605	9,605	9,605	9,602	9,508
Water surface along Kazakhdyra river channel	4,752	4,752	4,752	4,752	4,736	4,749
Zakirkol lake	2,664	2,674	2,695	2,488	2,791	2,395
TOTAL	305,242	306,099	308,945	287,727	290,161	284,949

Conclusion

The results of monitoring over changes in the area of water surfaces in Eastern and Western parts of the Large Aral Sea and wetlands of the South Aral region show that in 2019 water inflow was insufficient to ensure environmental stability of local water bodies and maintain water level in the Eastern and Western parts of LAS. The failure to ensure stable water supply hampers

efficient implementation of measures for stabilization of ecosystems and socio-economic development in the South Aral region.

Ensuring sustainable water supply for local water bodies in the South Aral region (Table 4) to keep their design areas could yield more than 10,000 tons of fish a year. However, the actual fish catch was 1,800 and 400 tons in 2017 and 2018, respectively. A comparative analysis of

the data on the Kazakh part of the Northern Aral Sea shows that the water surface area of the NAS was restored to 330,000 ha. Accordingly, there the fisheries sector yields up to 8,000 tons a

year, of which about 2,000 tons of fish are exported to EU.

Source: SIC ICWC research

2.3. Integrated RS-and Ground-Based Studies of the Exposed Bed of the Aral Sea

2.3.1. RS-based Observations over Water Surface and Wetlands of the Large Aral Sea and the Exposed Seabed

SIC ICWC maintains regular monitoring over changes in water surface and wetlands in Eastern and Western parts of LAS based on satellite imagery Landsat 8 OLI (www.cawater-info.net/arak/data/monitoring_amu.htm). The key data of RS-based observations over 2010-2018 is shown below.

Due to unstable inflow, the water surface area in Eastern and Western parts of LAS widely varies and depends on hydrological conditions of a year. In 2018, as compared to the wet year 2010, the water surface area shrank from 380,000 to 275,000 ha in Western part and from 533,000 to 202,000 ha in Eastern part of the sea (Table 6).

As a result of shrinkage of the water surface, the area of wetlands increased by 2018, as compared to 2010, by 107,000 ha in Western part and by 316,000 ha in Eastern part.

The current regime of LAS fully depends on the inflow from the Amu Darya and collecting drains to Eastern and Western bodies and on

water discharged from the Northern Aral Sea (Tables 6-7, Figure 5).

The Western and Eastern water bodies remain heavily saline, with salinity ranging from 130 to 350 g/l. In the Western sea, the water level keeps lowering under low water availability, but the depth remains at more than 20 m, while the water salinity is 130 g/l. The shallow Eastern sea depends on discharged water and its volume changes from 1 to 17 km³, whereas variations of the water level reach almost 3 m.

The ongoing changes in physical and chemical regimes of the Aral Sea affect the current status of the sea's biological systems. Despite huge losses of biodiversity as a result of the environmental disaster, the present biological community of the Aral cannot be referred as dead or dying one. The sea has quite specific but enough active ecosystems consisting of plankton and benthos species that were able to adapt to disastrous salinity. Their total biomass is quite substantial. Attempts are made to catch the dominating zooplankton species in LAS – Artemia shrimp – on a commercial basis. Thus,

Table 6. Comparison of the areas of open water surface and wetlands in LAS (2010-2018), thousand ha

Year / Month	2010 March	2011 August	2012 October	2013 August	2014 August	2015 August	2016 August	2017 August	2018 August
Western part of LAS									
Wetland	182.3	165.9	161.3	224.8	186.9	264.6	265.5	283.2	289.4
Water surface	379.6	396.1	369.7	360.7	337.5	315.8	295.8	278.2	275.0
Eastern part of LAS									
Wetland	964.1	1,243.9	1,214.5	1,155.3	1,019.6	1,183.9	1,340.8	1,036.0	1,279.6
Water surface	532.7	252.9	215.9	184.3	103.2	149.2	156.0	460.8	201.7

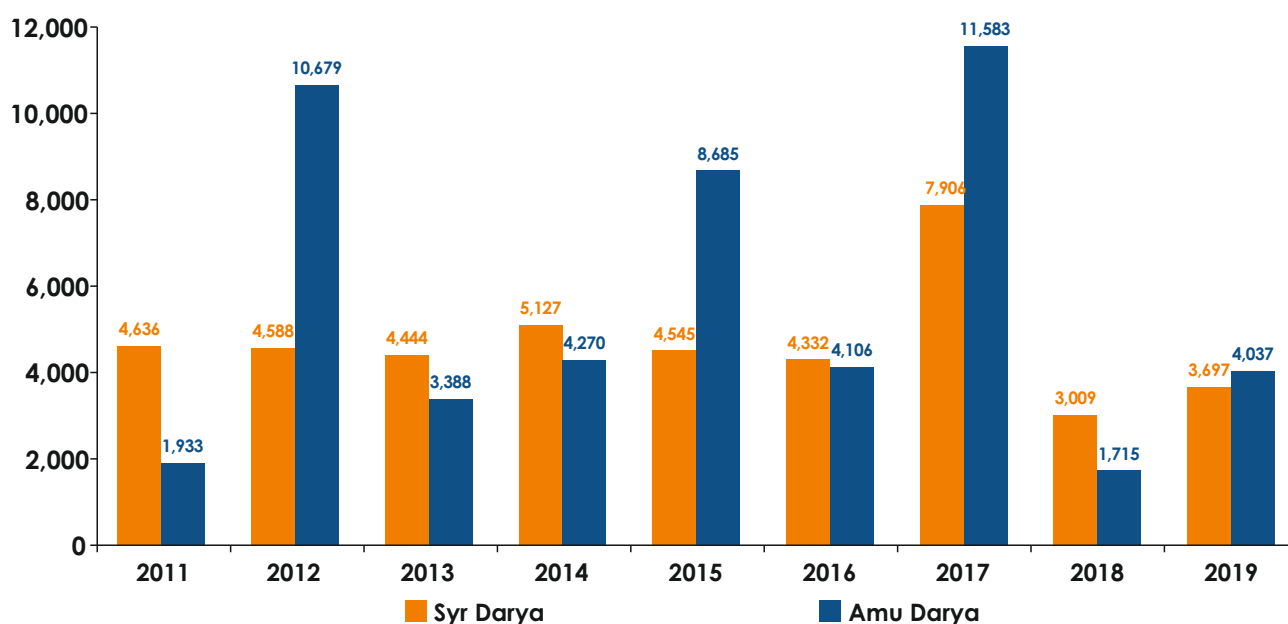
Table 7. Total inflow to LAS, Mm³

Year	Northern Aral Sea		South Aral region		Total discharge into LAS
	Total water supply to NAS from the Syr Darya River, Karateren section	Discharge from NAS into LAS	Total water supply to the Amu Darya delta, Samanbay section (incl. discharge of collector-drainage water)	Discharge from the Amu Darya delta into LAS	
2011	4,636	3,462	1,933	1,041	4,503
2012	4,588	2,004	10,679	3,533	5,537
2013	4,444	2,424	3,388	2,126	4,550
2014	5,127	2,570	4,270	520	3,090
2015	4,545	2,440	8,685	4,522	6,962
2016	4,332	2,816	4,106	1,874	4,690
2017	7,906	6,661	11,583	6,087	12,748
2018	3,009	3,310	1,715	846	4,156
2019	3,697	830	4,037	1,217	2,047

the evolution of biological communities that will be shaped, first of all, by the changes in sea's physical-chemical regime, should be in the focus of future research.

The data on changes in the area of the exposed seabed in the territories of Uzbekistan and Kazakhstan (Figure 6) and water supply (Table 7) indicates to close relationship between these two indicators. This is particularly relevant

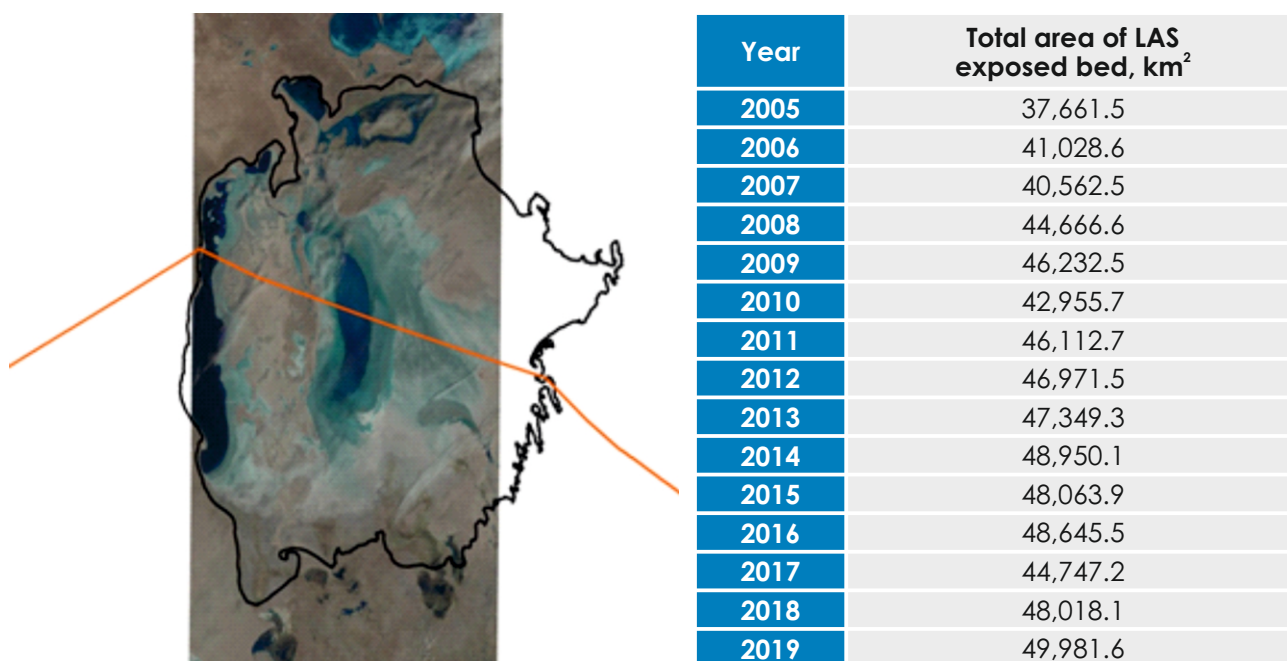
for the water surface area in **Eastern water body**, which fully depends on water discharged into the sea. The Eastern body is characterized by an extension of the water surface area if the total inflow to the sea is more than 8 km³ a year. When the inflow to the sea is less than 6 km³ a year, the water surface area shrinks (currently, the water level is 26.3 m). For example, when in 2017, the total discharge of water into LAS increased 2.7 times as compared to 2016 and reached

Figure 5. Dynamics of water supply to the deltas of the Syr Darya and the Amu Darya over 2011-2019, Mm³

12.7 km³ (Table 7), the water surface area also increased three times from 156 to 460,810 ha (Table 6). **The Western body** is characterized by downward trend of water level (at present, the water level is 24.7 m) and the reduction of the water surface area. The intensity of changes depends on inflow to the sea and water availability in Eastern part (difference in water levels between Eastern and Western parts).

As a result of shrinkage of the Aral Sea, the vast salt desert was formed on an area of more than 5.5 Mha on the exposed bed. Since 2011, the area of the exposed bed of LAS increased from 4.611 to 4.998 Mha, i.e. by 0.386 Mha (Figure 6). Thus, it is important to keep regular monitoring of ongoing processes within the exposed seabed and organize sound management of this complex anthropogenic-natural system.

Figure 6. Dynamics of the area of LAS exposed bed (excluding NAS) over 2005-2019



2.3.2. Results of the Expedition to the Exposed Bed of the Aral Sea in September-October 2019

From September 20 to October 20, SIC ICWC together with the International Innovation Center of the Aral Sea Region undertook the first field expedition from two planned ones (for 2019-2020) to the exposed bed of the Aral Sea. The expedition supported as part of a UNDP project through the funds of MPHSTF took place after 10 years since the last expedition to the Aral Sea bed in 2011. Preliminary results of the expedition are described below. The second expedition is planned for May 2020.

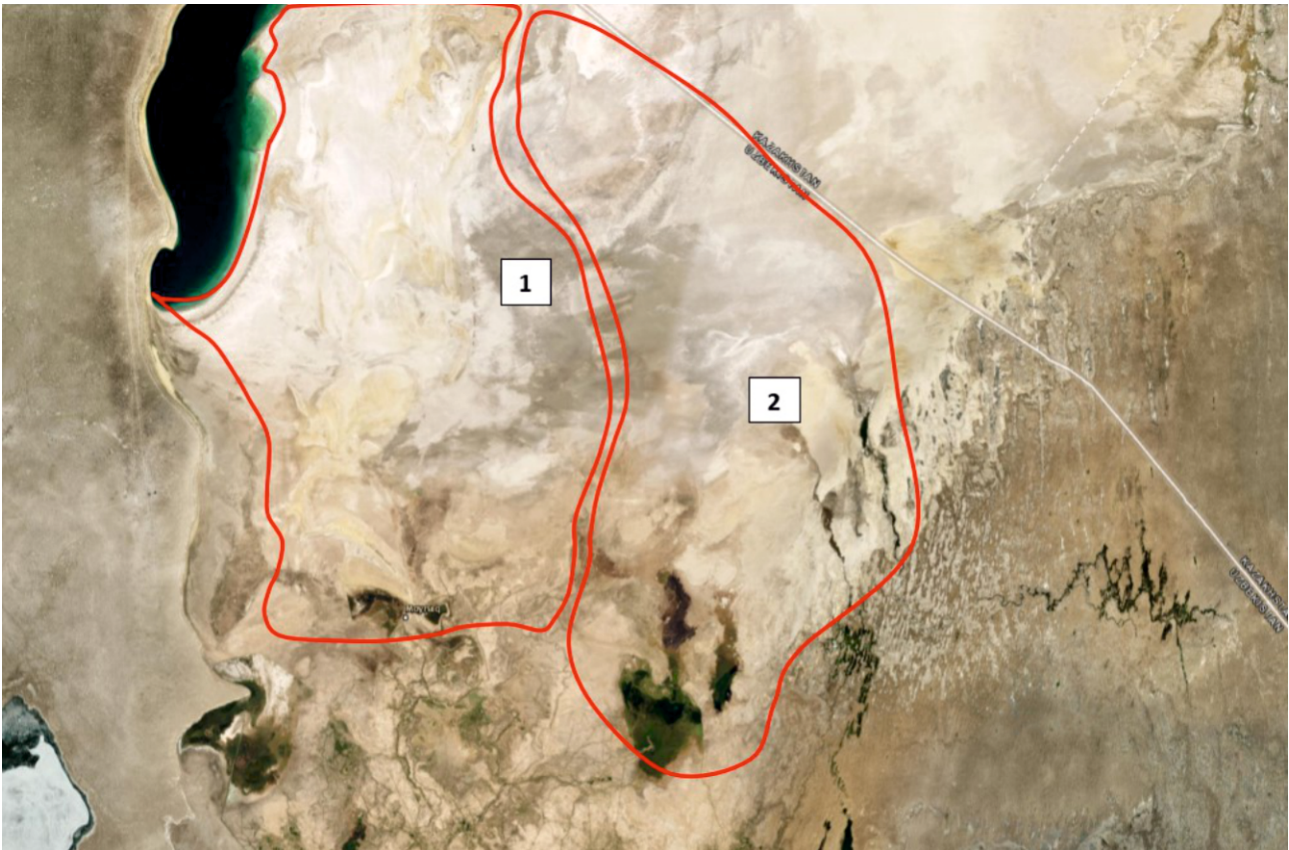
Scope and Methodology

The expedition covered 600,000 ha in Muynak surroundings: from Ustyurt cliff to the former channel of the Amu Darya between the Aral seashore, a watercourse from Rybatskiy bay and the Amu Darya delta (Figure 7).

It was a multi-disciplinary expedition. The following scope of work was completed:

- *Collection of RS-data:* land cover classes from satellite imagery;
- *Hydrogeology:* groundwater table and salinity;
- *Soil:* genetic description, texture, humus, carbonates, gypsum, salinity, salt composition, and soil type;
- *Vegetation:* composition, conditions of natural vegetation and man-made plantations, and assessment of self-organized vegetation;
- *Ecology:* stability of landscapes, risk classes.

Figure 7. The territorial coverage of observations on the exposed seabed by the first and second expeditions



The expedition routes were chosen as close as possible to those previously surveyed by SIC ICWC in 2005-2011. Four camps were set up: in Surgul'; Fitschenko bay; zero end; and, Sarbass. **20 routes** stretched from the camps to survey **1594 GPS points** within 6th to 17th classes.² The total route covered **2,500 km**.

The survey results were recorded in an observation log in line with the pre-defined format. All types of vegetation were described in control sites of the exposed seabed, as well as changes in landscapes of the exposed seabed were assessed by comparing the observation data with historical data (including also that of previous ground-based observations) and RS-data. The description of landscape, vegetation and soil cover along each of 20 routes is provided below.

Landscape, Vegetation and Soil Cover in the Surveyed Area

Six routes were taken from the first camp in September 22-26. 249 GPS points were surveyed and described.

Route 1 (44 points). Eastward from the first camp.

The main plant in first points is *Halostachys* with dried-out branches and 20-30% coverage. The land surface has slumps and sinkholes 0.1-0.4 m in diameter. The relief is flat, the surface has crust with shells, and the vegetation cover is 30-40%. Starting from **point 8**, rare vegetation, 0.5 m high, is observed on sandy hills (0.2m). Plant seeding in



² The first 5 classes include the territories with no data (class 1), water surface (classes 2-3), coastal area/inaccessible area (classes 4-5)



spring 2018 has produced nothing. The relief is represented by sand dunes, with sandy hills reaching 10-20 m. The soil is comprised of wet coastal solonchak, semiautomorphic, periodically flushed, with spots of shell, and the vegetation occupies 10%.

Point 15. Rare 5-6-old saxaul, 1.8 m high. There is self-organized vegetation. The soil is under annual grass (dried out after summer). The sowing lines are visible but without vegetation. The relief is flat, with rare dunes. The soil is coastal solonchak, crust, takyr-like, semiautomorphic. Vegetation occupies 10%.



Point 20. There are 4-5-old and plenty of young saxaul plants. As compared to 2007, there is intensive self-organization of vegetation. The vegetation cover is almost 100%, but saxaul is affected by disease. The relief is flat.

Point 22. The territory was flooded before. This resulted in the vegetation cover comprised mainly of tamarisk (60% coverage). The relief is flat.

Point 37. The relief is flat, the soil is compacted due to operation of a drilling aggregate for gas exploration. The vegetation cover is comprised of annual dried-out grass. Furrows are cut in most places along the route to accumulate sand. The furrows, with rarely planted seedlings, virtually have no self-organized vegetation.



Route 2 (51 points). From the camp towards the cliff in southwest and western directions. Plain sloping towards the cliff.

At the start of the route, rare young saxaul plants mixed with dried-out annual grass were observed. The relief is flat, with minor slope and furrows cut for sand accumulation. It is followed by rare dunes with tamarisk and *Halostachys* 0.4-1.0 m high. The relief is flat with very rare bushes on low



dunes. The soil is represented by crust, in placed crust-puffed solonchak, which is wet on the surface and with white spots. There are furrows for sand accumulation. The landscape changes by very rare bushes of tamarisk, *Halostachys*, and *Nitraria schoberi*. The relief is flat, with rare mixed bushes, puffed soil and sand-accumulation furrows. Dried-out seedlings of saxaul were found. Further along the route (**point 92**), mixed vegetation of *Halostachys*, with rare tamarisk is observed. Thanks to an earthen dam, the area before the dam was flooded. There is self-organized vegetation of *Halostachys* and tamarisk in this area. The fields on the other side of the dam have no vegetation, except for very rare and low dunes with *Nitraria schoberi*. Next (**point 94**), the landscape changes by rare perennial saxaul plants reaching 3.5m mixed with annual dried-out grass. There are very rare sandy hills with saxaul and *Nitraria schoberi*.

Route 3 (42 points). Northwestward from the first camp

At the beginning of the route, the vegetation is presented by *Halostachys* and tamarisk, with *Climacoptera Botsch* in places. The relief is flat, with sandy loam, light loam from the surface. The territory is divided by earthen dams. Next (**point 96**), tamarisk reaching 2m in height is observed. *Halostachys* and *Climacoptera Botsch* are also found. The relief is flat, with semi-hydromorphic solonchak periodically flushed. The bare soil is white, with salty spots after drying out. Groundwater is bedded close to the surface.

After flooding in 2017, young plants of tamarisk (0.4-0.7 m in height) grew in place of dried tamarisk bushes. Higher bushes of 1.5-2m are found along the road, as well as dried-out annual grass and *Climacoptera Botsch*. The relief is flat. Next in **point 103** the landscape changes, rare *Halostachys* and tamarisk associations along the road, as well thick cover of dried-out annual and other



grass are observed. The relief is flat, with very rare dried-out grass on hydromorphic solonchak with salt crust. The sand-accumulation furrows are cut.

Next (**point 112**), the vegetation cover is comprised mainly of tamarisk, the density of which is 50% in the area close to the road. Further away from the road, fields with dried-out annual grass and *Climacoptera Botsch* are observed. The relief is flat.

Further on the route (**point 113**) the terrain is flat, the soil is hydromorphic solonchak with salt crust and includes rare annual grasses. The sand-accumulation furrows are cut.



Within **point 118**, the relief is flat. Dried-out annual grasses are observed. Sand-accumulation furrows are cut on both sides of the road. The soil is crust-puffed solonchak.

Route 4 (67 points). Towards Sudoche-Adjibay hydrogeological section, directly north

At the beginning of the route, rare saxaul in association with very rare bushes of tamarisk, *Halostachys* and orach (*Atriplex*) were observed. Flat fields almost have no vegetation cover. The soil has white spots of salt and rare shells on the surface. The sand-accumulation furrows are cut.

Dried-out annual grasses with distant single saxaul and Kandym (*Calligonum sp.*) are observed in **point 182**. The terrain is open and flat. The soil cover is comprised of sand with shells.



Route 5 (48 points). From the first camp to the north, through the Tigrovyy Khvost

Rare perennial and young saxaul is observed at the beginning of the route. There is self-organized vegetation, including *Climacoptera Botsch* and *Halostachys* and tamarisk on rare dunes.



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sely covers the area 60 m far from the well. Since 2006, saxaul plants have grown up to 4 m and expanded (self-organization).

Route 6 (66 points). The road from Muynak to the second camp

At the beginning of the route, there is an open flat terrain under old saxaul on 70-90%. There were a harbor of ships and the Injener-Uzyak channel at **point 289**. The ships were moved to the cemetery of ships in Muynak. Further (**point 312**), rare bushes of perennial saxaul (10-15 years) and single bushes of young self-organized saxaul are observed. *Climacoptera Botsch*, *Salsola*, and orach are found rarely. The relief is flat, with old cut furrows. Next (**point 313**), rare bushes of perennial saxaul (10-15 years) and *Kandym* (*Calligonium L.*) grow. *Climacoptera Botsch*, *Salsola*, orach, and dried-out annual grasses are found. The relief is flat, but hills overgrown with *Kandym* are found in places.

There are perennial saxaul (up to 3 m in height) and *Kandym*, annual dried-out grasses, and rare young saxaul plants. Self-organization of plants is observed. The relief is uneven, with blown sand and dunes.

Next (**point 209**), the soil is under perennial saxaul (2 m in height) and young saxaul. There is self-organized vegetation. *Climacoptera Botsch*, young drying tamarisk, orach, saltwort (*Salsola*) and dried-out annual grasses grow there. The terrain is open and flat, and the center of the field is crossed by the asphalt road. The soil is comprised of semiautomorphic, loose crust sand-covered solonchak with shells. The landscape changes by rare perennial saxaul. The terrain is flat. There is a well (Tigrovy Khvost). The well is surrounded by rare perennial saxaul and *Climacoptera Botsch*. More than 3 m high perennial saxaul den-



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Route 7 (43 points). Road from the second camp northeastward along the Syr Darya River channel

In **points 317-318** saxaul in association with Kandym, as well as orach and *Climacoptera Botsch* are found. The relief is uneven, with sandy hills, 0.5-1.8 m high. Mechanical sand-protection is made of reeds.

In **points 322-326** saxaul in association with Kandym, as well as orach and *Climacoptera Botsch* are found. The relief is flat, but sand dunes 0.5-



0.8 m high are observed in places. The soil is sand-blown, crust solonchak (a salt layer beds at 20-26 cm), semiautomorphic.

Different landscape: very rare tamarisk, single *Halostachys* and also *Climacoptera Botsch*. Furrows are cut for sand accumulation. The soil is crust solonchak.

Point 330. Old perennial saxaul plants, 2-3 m high; 5% vegetation cover; there is self-organization of plants. The terrain is open and flat, with furrows cut for sand accumulation. Further (**point 337**) vegetation changes: *Halostachys* in association



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with rare tamarisk are found. The open and flat terrain is subjected to flooding; therefore, it is overgrown with plants. The soil is not salinized and includes shells. At the end of the route (**point 353**), the terrain is open and flat; furrows are cut; the soil is heavily saline, with white spots.

Route 8 (62 points). Eastward from the second camp (Berdybek locality)

Point 357. Rare perennial bushes of saxaul, 1-2.5 m high, Saltwort, *Sálsola*, *Climacoptera Botsch*, and orach are found. The terrain is covered with blown sand, the relief is varied. Perennial saxaul reaches 1.5-3 m; the vegetation cover is 5%. Further, *Sálsola*, orach and dried-out annual grasses are found. The relief is hilly, with sandy hills reaching 3 m.

Point 401. The relief is hilly. Tamarisk up to 2 m high and also shorter tamarisk of 0.4 m in association with rare *Halostachys* grow on the hills. Saxaul up to 3 m high grows in association with *Sálsola* 0.5-1.2 m high, with 20% coverage. The terrain is hilly at the edge of blown sand. The height of the blown sand reaches 3-4 m.

Route 9 (124 points). First direction – northward from the camp, then, from the second to the third camp

Point 431. Saxaul 1-3 m high in association with *Sálsola*, as well as *Climacoptera Botsch* and dried-out annual grass are found. The terrain is hilly, with 1-1.5 m blown sand. In other points, saxaul 2-3 m high and *Sálsola* are observed. There is self-organized young saxaul. *Climacoptera Botsch* and dried-out annual grass are observed. *Rhodiola rosea* was found also. Further on the route in **point 452** vegetation changes by tamarisk, 1-2 m. There are also reed, *Climacoptera Botsch*, orach, and very rare saxaul. The relief is flat.

Point 539. The relief is varied. Gasmen built dams and roads. The vegetation cover is comprised of tamarisk and reed, young *Halostachys* and *Climacoptera Botsch*. All plantations of tamarix on newly cut furrows have been dried out.

Route 10 (71 points). From ground zero towards Vozrojdeniye Island

The relief is uneven, with sandy soil and shells. In **point 579**, to the right of the road, saxaul plantations in furrow beds are observed. There is colonization of the plant on 30-40%. Orach, *Climacoptera Botsch* and dried-out annual grasses are observed also. Further on the route in **point 583** and many other points, tamarisk seedlings were planted in furrows. Rare results of such plantations are clearly observed. But most

seedlings have dried out. The relief is flat, with furrows. For **points 600-602** the forestry expert M. Ganiev recommended aero-sowing. Next, in **point 606** the relief is hilly, with sandy dunes reaching 1 m and big stones. The vegetation includes Kandym and Selinum.

At the end of the route in **point 615**, furrows are cut on the both sides of the road, and tamarisk seedlings were planted on the left side of the road, but no colonization was observed. Saxaul was sown between furrows. No sprouts are observed. On the right side of the road, tamarisk plantations and saxaul sowing traces are also



observed. However, no positive results are seen. Orach and *Climacoptera Botsch* are found. The relief is flat; the soil is saline, with white spots.

Route 11 (196 points). Continued route 10 from the ground zero towards Vozrojdeniye Island

In **points 625-630** the relief is flat; the soil is heavily saline. Furrows are cut for sand accumulation. Tamarisk seedlings were planted but have not taken root. *Climacoptera Botsch* is rarely found. On the left side of the road the furrows are cut for 100-150m. Aero-sowing of Kandym was done. Orach, *Climacoptera Botsch* and very rare Kandym are found. The relief is varied, with sandy dunes reaching 1 m; the soil is sandy with shells. Furrows are cut for sand accumulation. Those were also planted with seedlings.

Point 694. The terrain is represented by sandy dunes up to 1 m high. The soil is gypsum-bearing, sandy. There are self-organized Kandym, *Astragalus*, saltwort and *Salsola*.

Point 732. The furrows have fully accumulated sand, and seedlings took roots. The vegetation cover is represented by young saxaul, and *Climacoptera Botsch* and orach are also observed.



Route 12 (91 points). From ground zero towards Muynak

Point 830. Very rare bushes of saxaul, *Climacoptera Botsch*, saltwort and orach. There is self-organized young saxaul.

Point 866. Perennial saxaul plants up to 3 m high are found. Dried-out annual grass is observed in places.

At the end of the route (**point 905**), very rare saxaul, mainly along the road, camel's-thorn (*Alhági*), wormwood (*Artemisia*), *Climacoptera Botsch*, saltwort and dried-out annual grasses are observed. The relief is uneven; there are big dunes 5-20 m high. The soil is sandy.

**Route 13 (111 points). Along the dam of Muynak bay**

Point 928. Mainly reeds, as well as *Climacoptera Botsch* and camel's-thorn are observed at the dam and on escarpment.

Point 948. The open and flat terrain is under tamarisk, 2-4 m high; there is self-organized young tamarisk. Wormwood and saltwort are also found.

Point 960. Saxaul, 0.5-2 m, high is mainly found. Rare tamarisk and dried-out annual grass are observed also. The terrain is open and flat. The soil is automorphic crust-puffed solonchak. Saxaul plantation of Temporal afforestation site starts there. Next (**point 1000**), young tamarisk, 0.3-0.4 m high, and rare perennial one reaching 1.7-2 m in height are found together with dense reed and dried-out wormwood. On the one hand, there is self-organized young tamarisk, and, on the other hand, plants dry out.

Point 1006. The terrain is flat. The soil is coastal crust solonchak, wet from the surface, with salt spots and periodically flooded. Rare tamarisk, 1-2 m high, in association with *Halostachys* (0.9-1.1 m) is found.

**Route 14 (93 points). From the cemetery of ships the way towards the former sea coast and downward towards the seabed**

Point 1041. On the right side of the road, down the exposed bed the relief is flat. The soil is sandy and crusted. Construction wastes are scattered. Glass and plastic bottles and plastic bags are observed along the route. On the left side of the road, rare bushes of perennial saxaul,

tamarisk and *Halostachys* (0.4-1.2 m), as well as rare dried-out annual grasses are observed.

Point 1057. There are saxaul (1-1.5 m), *Astragalus*, rare tamarisk, *Selinum*, and *Aristida L.* Sand dunes reach 1-3 m in height. The soil is comprised of yellow-colored sand.

Further on the route (**points 1057-1062**), there is open hilly terrain. The soil is combined of loose-crust solonchak and sand with shells. The vegetation cover includes saxaul, tamarisk and *Climacoptera Botsch*.

Point 1091. Open flat terrain; desert crust soil, saline, solonchak with white spots; no vegetation.

Point 1107. Landscape changes by sand dunes, 0.5-1 m high. The soil is sanded solonchak, with shells and stone inclusions.

Point 1115. Perennial saxaul (0.5-1.5 m) and young saxaul are observed. There is self-organized vegetation. *Halostachys*, *Kandym*, *Selinum*, *Aristida L.*, and camel's-thorn are also found.



Route 15 (152 points). From Muynak towards Mejdureche reservoir and then towards the former channel of the Amu Darya via Parlitau

Point 1165 in the direction of Muynak towards Sheghe, head structure of the Muynak canal. At the time of expedition, huge efforts were made at Mejdureche reservoir in order to ensure discharge from the reservoir through the former channel of the Amu Darya to the exposed seabed. The relief is hilly, with elevations ranging from 0.5 to 1 m. The soil is light and covered with grass. Tamarisk, 0.9-1.5 m high, and rarely saxaul, wormwood, and camel's-thorn, *Nitraria schoberi* and *Lýcium* are found.

Further (**point 1184**) the relief is flat, with dry soil and no water. Saxaul, 2-3 m high, camel's-thorn, wormwood, and dried-out annual grasses are found. The relief is flat; it is the coastal strip of the former channel of the Amu Darya. Perennial saxaul, rare tamarisk, and camel's-thorn are found.

Point 1223. Perennial saxaul covering 70%; rare tamarisk. The relief is flat.

Further (**point 1243**), on the left bank of the former channel of the Amu Darya, rare perennial



saxaul and 90% dried-out tamarisk are found. The vegetation cover is about 50%. There is camel's-thorn. The relief is flat.

Route 16. (103 points). From Muynak towards Sudoche lake. The aim of this route – studying the status of the lake and its adjacent area

Point 1272. The relief is flat and open. The soil is crusted solonchak. The vegetation is comprised of saltwort and 0.5 m high *Salsola*. The vegetation cover is 30%.

Point 1329. Big old saxaul plants (1.5-3 m) and young saxaul are found. There is self-organization of plants. The relief is comprised of sand dunes. Mechanical sand protection of reeds is organized.

Point 1359. The relief is flat. There are old saxaul, 2-3 m high, and dried-out annual grass. Self-organization of saxaul is observed.

Point 1365. Gasmen built dams in some places to protect their structures from flooding. An escape channel was also built. A gas drilling unit is located close. The terrain is open.

Route 17 (31 points). Continued route to Sudoche (route 16), then eastward from the old drill site via dried depression towards Muynak ecosite

Point 1388. The relief is flat at the beginning of the route. The soil is black-colored sandy loam. The area has been flooded, with following overgrowth with tamarisk and, later, *Climacoptera Botsch* started to grow. Tamarisk has dried out on 70-80% of the area, and *Halostachys* (0.5-1 m) is also dried out.



Point 1392-1395. Further elevations of the relief change from 0.5-1 m. There are sandy dunes; the area is open. *Climacoptera Botsch* and rare dried-out grasses are found.



Route 18 (54 points). The road towards "oil drill site" right northward from Muynak

Point 1443. The relief is flat. Furrows are cut for sand accumulation. The area damaged from fire is overgrown with tamarisk. *Halostachys*, dense reed, orach and dried-out annual grasses are rarely found. The soil is crusted solonchak. The furrows were filled with water flowing from Rybache bay.



Route 19 (72 points). From Muynak to Kyzyljar, Tek-Uzek canal. The road crosses the site from Muynak bay to Karadjar settlement, covering the area that was not surveyed before

Point 1460. The relief is flat. Tamarisk and reed, 1-2.5 m high, are found. The vegetation cover is 80%.

Point 1474. The terrain is flat; the soil is dark sandy. Tamarisk, reed, rare *Halostachys*, wormwood, *Climacoptera Botsch* and saltwort are found. Tamarisk reaches 0.5-3 m in height. Saltwort covers 95%. The terrain is open and flat; the soil is crusted solonchak. The channel passes between **points 1518 and 1519.**



Route 20. From Muynak towards south, east and west

Point 1527. The topography is of closed type; the surface is covered with old saxaul. 30 m to the right from the road, the site is dammed.

Point 1555. The relief is flat. There are rare tamarisk and dense reed. The vegetation cover is 100%.

Point 1590. Flat field, with soil subsidence along the road. *Halostachys* is found rarely.



Point 1594. Hilly terrain, with sandy dunes. *Halostachys*, tamarisk, saltwort, *Salsola* and *Climacoptera Botsch* are found.

Main Findings

The 2019 expedition covered a considerable part of the exposed seabed – 600,000 ha or about 20% of its southwest territory. This territory refers to the earliest dried seabed area, which is characterized by non-uniform processes and sharp differences in landscapes.

The exposed bed of the Aral Sea is a unique laboratory, where a new landscape with gradually forming soil cover evolves under influence of natural processes. At the same time, due to desertification and anthropogenic impact, destructive processes also take place. Formation, development and change of one formation by another one mirror the evolution of landscapes and, first of all, depend on local characteristics of the exposed seabed, the composition of bed sediments, their salinity, groundwater depth and salinity, wind direction and strength and, also, human interventions. Various vegetation covers and landscapes combined with different forms of meso- and micro-relief could be observed along the expedition route.

All those processes are interlinked and impacted by afforestation and, at the same time, have their effect on progress of afforestation. Self-organization of such plants as *Tamarix hispida* Willd (jyngyl) in association with *Halostachys belangeriana* Botsch or *Phragmites australis* (ordinary reed) and dense perennial saxaul bushes was identified.

Water availability, which is sufficiently high in the surveyed area, as compared to the rest of the exposed seabed, also has its effect on the status of vegetation. For example, the expedition observed watering of the former Adjibay bay, where water is discharged from the Sudoche Lake system. In the wet year 2017, wet zones were formed around wasteways of Adjibay, where seeds of bushes and other plant types spread and contributed to self-organization of plants on the substantial area.

It is necessary to maintain periodical water spills to save wet zones on the exposed seabed. If re-wetting of the soil on the exposed bed is not maintained for a long period of time, the soil degrades, the water table drops, and soil salinity increases. Biodiversity also deteriorates. The existing vegetation cover starts to dry out.

Operations of gas- and oil facilities on the exposed bed related to construction of roads,





dams, and wasteways with pipes and crosses also hamper self-organization and preservation of plants.

Construction of hydrotechnical structures and utility facilities on the exposed seabed without coordination with local water-management agencies that operate local water bodies in the Aral Sea region also threatens safety of these structures and facilities. The Amu Darya River's flow is very variable, with short-term floods that pose risks to structures.

Structures and roads built by gasmen on the exposed seabed can be utilized for water-management purposes. In particular, from the newly constructed Amu Darya-Sudoche-Adjibay system of watercourses water can be delivered through existing channels and dams to the Western part of LAS.

The negative environmental impact of new infrastructure is also exerted by drilling units that lead to destruction of grass cover and vegetation on the exposed seabed, where ongoing restoration processes are particularly slow. A lot of machines drill wells on the exposed seabed for natural gas production. The vegetation cover has been fully destroyed on an area of about 2-3 ha, where drilling units were installed and drilling was completed. Vegetation will not be restored in the drilling sites even after 10 years.

Following decisions of Uzbekistan's leadership, the afforestation process is underway on the exposed seabed. Furrows were cut for accumulation of sand in most places along the expedition's routes. Seedlings were sown in those furrows, but not densely yet, and a minor share of these seedlings took roots.

Self-organization of plants is particularly intensive at the end of plots with man-planted saxaul. This clearly indicates to the positive impact of mitigation measures on environmental situation within the exposed seabed.

Pollution. Trash, including glass and plastic bottle and plastic bags, was found along the expedition's routes. The site with construction wastes occurred close to Muynak. Thus, urgent measures need to be taken by the State Committee for Nature Protection in order to prevent the negative impact on the environment of the exposed bed of the Aral Sea.





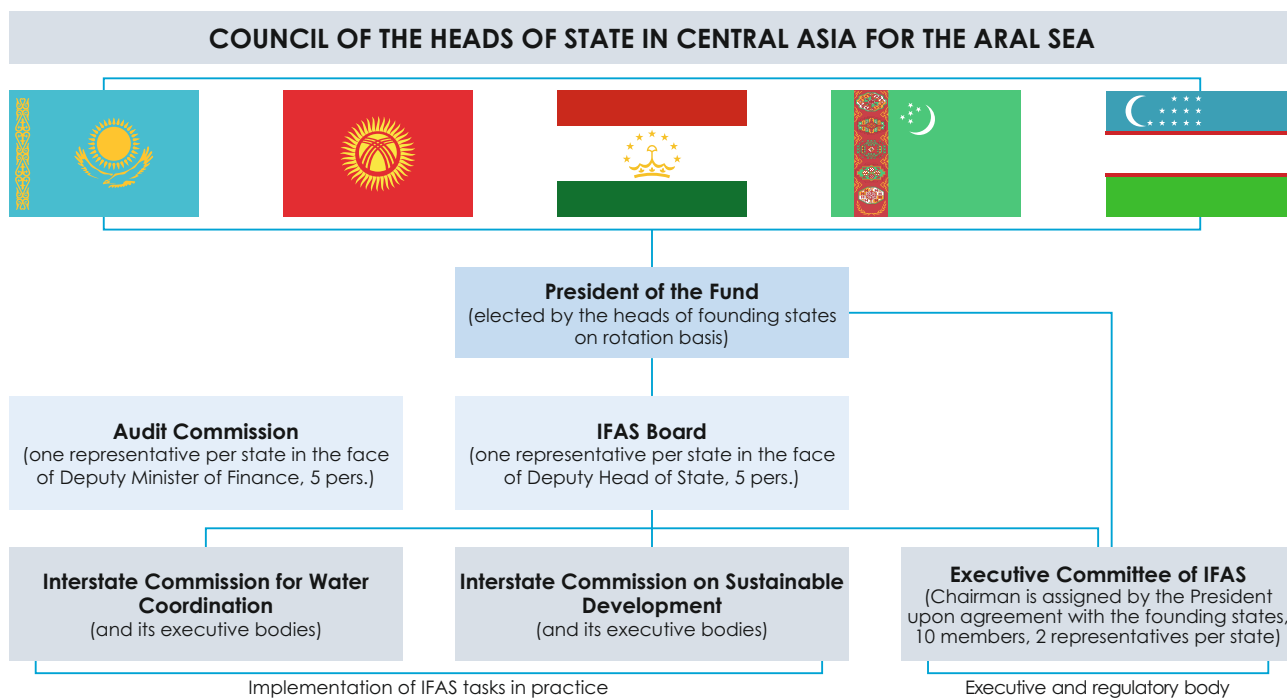
Section 3

IFAS and Other
Regional Organizations
in Central Asia

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.



The chairmanship in IFAS is rotated among the CA countries every three years.

President Gurbanguly Berdymukhamedov chaired IFAS during [Turkmenistan chairmanship](#) in 2017-2019.

The Executive Committee of IFAS (EC IFAS) was based in Ashgabat. The mission of Turkmenistan's chairmanship in IFAS was to further de-

velop and strengthen cooperation among the countries in Central Asia for socio-economic and ecological improvement in the Aral Sea basin.

Tajikistan took over the IFAS chairmanship for the period of 2019-2022 according to a decision of the Second Consultative Meeting of the Heads of CA State (November 29, Tashkent). President Emomali Rahmon will be chairing IFAS over that time.

3.1.1. Initiatives of the Presidents of CA states voiced at XII Summit of the Heads of IFAS Founder-States

[XII Summit of the Founder-States](#) was held in the city of Turkmenbashi on the 24th of August 2018. The Presidents of CA states has addressed a range of topical issues and proposed important initiatives. Following the Summit, a [Joint Communiqué](#) was adopted.

The Heads of State have highlighted their view of IFAS as a universal platform for coopera-

tion of the countries in the region to solve the entire complex of issues of regional importance.

The Presidents have put forward the following initiatives:

- Kazakhstan: automation, establishment of an international water and energy consortium for CA;

- Kyrgyzstan: consideration of hydropower interests, shift in paradigm of IFAS, compensation mechanism for water storage, revisiting of water allocation limits;
- Turkmenistan: water diplomacy, adoption of a Special UN Program for the Aral Sea Basin;
- Tajikistan: drinking water supply from Lake Sarez, adaptation measures;

- Uzbekistan: environmental innovations, afforestation, protected zones in the Aral Sea region, water conservation, and scientific cooperation.

The information on implementation of the Presidents' initiatives in 2019 is provided in the sections dedicated to activities of executive bodies of [ICWC](#), [ICSD](#) and in "[Key Water Developments in Countries of Central Asia](#)".

3.1.2. UN-IFAS Cooperation

The [85th plenary meeting](#) of the UN GA 73rd session have adopted unanimously Resolution A/RES/73/297 "Cooperation between the United Nations and the International Fund for Saving the Aral Sea" (May 28, New York). Twenty one countries co-authored this document.

The UN GA in its Resolution:

«1. Notes the need for further improvement of the activities of the International Fund for Saving the Aral Sea to strengthen regional cooperation ...;

2. Also notes the importance of strengthening cooperation and coordination between the United Nations system and the International Fund for Saving the Aral Sea, and invites the Secretary-General to hold for that purpose regular consultations with the Chair of the Executive Committee of the International Fund...;

3. Further notes the proposal on the need to consider the possibility of developing a Uni-

ted Nations special programme for the Aral Sea basin and in this regard to hold consultations in 2019 with the Executive Committee of the International Fund for Saving the Aral Sea, Member States and relevant United Nations agencies;

...

6. Requests the Secretary-General to report to the General Assembly at its seventy-fifth session on the implementation of the present resolution;

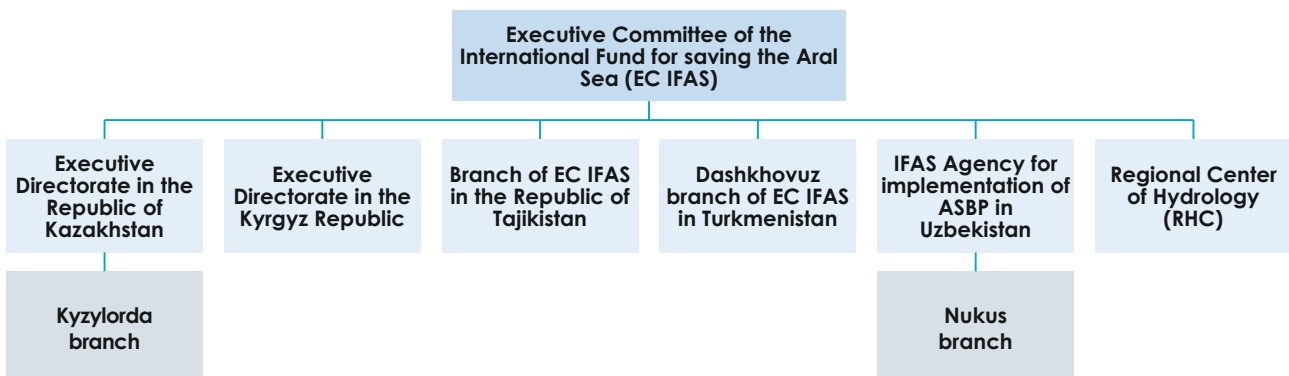
7. Decides to include in the provisional agenda of its seventy-fifth session, under the item entitled "Cooperation between the United Nations and regional and other organizations", the sub-item entitled "Cooperation between the United Nations and the International Fund for Saving the Aral Sea".

The full text of the document is available on <https://undocs.org/en/A/RES/73/297>.

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 13 July 1993. It serves as a platform for dialogue between the CA countries and the international community. According to the decision of the President of Turkmenistan G. Berdymukhammedov, EC IFAS was established in Turkmenistan to operate from 2017 to 2019.



Location of EC IFAS by Country and Year



Activity of EC IFAS in 2019

Development of ASBP-4 and the institutional and legal improvement of IFAS. In 2019 the development of ASBP-4 comprised of four directions (integrated use of water resources; environment; socio-economic; and, improvement of institutional and legal mechanisms) continued.

Two meetings of Regional work groups (RWG) were held in Ashgabat:

- At the [2nd meeting](#) (July 30-31) (1) **as part of the development of ASBP-4**, proposals submitted by countries were considered and a list of 34 projects was adopted for further development by EC IFAS together with experts and members of RWG (July 30); (2) **as part of the improvement of IFAS**, proposals from the countries were considered and next steps were approved (July 31).

- At the [3rd meeting](#) (November 25-27) (1) **as part of the development of ASBP-4**, 34 project proposals were considered and approved (November 25-26). A package of projects for ASBP-4 was composed to disseminate among the countries for approval and adoption by the Board of IFAS. EC IFAS and representatives of international organizations and donors held a meeting to identify concrete areas of cooperation in implementation of ASBP-4 (November 27); (2) **as part of the improvement of IFAS**, next steps were discussed and proposals on IFAS improvement from Kazakhstan and Uzbekistan were considered. Members of RWG were requested to submit their proposals to EC IFAS in a previously agreed format. The meeting participants also discussed modalities of joining to the Framework Convention on Environmental Protection for Sustainable Development in Central Asia (November 27).

The UN Special Program for the Aral Sea Basin (UN SPAS) and multilateral consultations for its development. During a special session of the International Conference “The Role of Water Diplomacy in achieving Sustainable Development in Central Asia” a preliminary meeting was con-

vened to discuss organization of consultations on the concept of the UN SPAS (June 5, Ashgabat). The UN SPAS was initiated by the President of Turkmenistan and presented in several meetings, including a side event “[Environment and Disasters: Closing the gap in the Asia and the Pacific region](#)” during the Sixth Session of the Committee on Disaster Risk Reduction, when main steps to prepare multilateral consultations in the UN-IFAS format and launch a pilot project on the UN SPAS were demonstrated (August 29, UN ESCAP Headquarters); [Ministerial meeting](#) as part of the XIV Conference of the Parties to the United Nations Convention to Combat Desertification (September 9, New Delhi, India); [Regional conference](#) “Innovative approaches and solutions in the system of sustainable water resources management and the possibility of their use in Central Asia” (December 18-19, Almaty).

[Multilateral consultations](#) on the development of the UN SPAS were organized within the framework of UN GA Resolution 73/297 of 28 May 2019 and following the decisions made by the Council of the Heads of IFAS Founder-States on 24 August 2018 (December 18, Ashgabat). Representatives of EC IFAS, UN agencies and specialized institutions, other international organizations and embassies accredited in Turkmenistan, and experts of relevant institutions of CA countries took part in this event. The delegations discussed problems of inland waters and their solution at the national, regional and global levels, while focusing on the main elements of the Program. They also considered possibilities and prospects of developing UN-IFAS cooperation in the future, supported the establishment of the UN Multi-Partner Human Security Trust Fund for the Aral Sea region, called upon relevant UN agencies to consider possibilities to conduct an independent feasibility study on the modalities for strengthening regional coordination and cooperation to study, mitigate and minimize the consequences of natural disasters in inland water basins such as the Aral Sea and

to assess, in this context, the viability of establishing the United Nations Special Program for the Aral Sea basin.

A thematic event “Cooperation of international institutions for sustainable development in Central Asia: the UN-IFAS model” was held by the Turkmen side at the UN Headquarters (July 17, New York). An urgent need of strengthening collaboration in resolving the problem of the Aral Sea was stressed. In this context, the upcoming multilateral consultations would contribute to the establishment of a multifaceted international mechanism in resolution of the ecological catastrophe of the Aral Sea region.

The outcomes of the Turkmenistan’s chairmanship in IFAS over 2017-2019. Activities of Turkmenistan under its chairmanship in IFAS and country contribution to the development of ASBP-4, establishment of cooperation between the United Nations and IFAS, and development of UN SPAS were discussed at [UNESCO International Water Conference](#) (May 13-14, Paris); [briefing](#)

on the adoption by the UN GA of the Resolution “Cooperation between the United Nations and the International Fund for Saving the Aral Sea” (May 29, MFA of Turkmenistan); and, [International Conference](#) on the “Role of Water Diplomacy in achieving the Sustainable Development in Central Asia” (June 5, Ashgabat).

The outcomes of the chairmanship were summarized at the briefing, where representatives of different agencies, heads of diplomatic missions and representative offices of Turkmenistan abroad, local and foreign mass media, academia and students took part (December 28, Ashgabat). New [publications](#) “The International Fund for Saving the Aral Sea” and “The Caspian Sea: Advantages of Developing International Economic Cooperation” were launched. Summarizing its chairmanship, the Turkmen side published a special collection of information materials and documents dedicated to the establishment and development of the International Fund for Saving the Aral Sea.

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 Kazakh part of the Aral Sea basin.

Activity of ED IFAS in Kazakhstan in 2019

On development of ASBP-4 and institutional and legal improvement of IFAS. Based on the projects that were included but not implemented within the framework of ASBP-3, the Executive Directorate drafted the regional project proposals for their inclusion into ASBP-4 and submitted them to the Kazakh Ministry of Agriculture. Representatives of the Executive Directorate took part in the 3rd meeting of RWG on the development of ASBP-4 and the improvement of IFAS and in a coordination meeting of EC IFAS with donors (November 26-27, Ashgabat).

Project activity. ED IFAS implements international grant projects for a total amount of \$655,000.

- The WB-supported Skills and Jobs project together with DKU and other Kazakh universities,

as well as the National chamber of entrepreneurs “Atameken”;

- The project “Equipment and plants for organization of forest nursery to demonstrate rehabilitation of desert in the Aral Sea region”, as part of which a pilot site was organized around the administrative building of the Barsakelmes national nature reserve to demonstrate and popularize resource-saving methods for development of degraded and subjected to desertification land and to develop further methodological and scientific recommendations for efficient organization of green belts;

- The project “Fodder base for wild ungulate animals in the Barsakelmes national nature reserve”, for implementation of which a cont-

ract was signed with the Republican NGO “Association for the Conservation of Biodiversity of Kazakhstan” (April 15). Full assessment and mapping of pastures in the nature reserve will be undertaken to estimate the fodder resources available for wild ungulate animals (Asiatic wild ass, saiga antelope, Persian gazelle), the yields of main plant communities in the reserve and the fodder value of natural pastures;

- UNECE Regional Project “Dam safety in Central Asia: capacity building and regional cooperation”. As part of the project, a meeting was held with the delegation of the Slovakian state enterprise “[Vodohospodarska Vystavba](#)” (meaning Water Management) (April 24, Nur-Sultan); a Memorandum of Cooperation was signed between the “[Vodohospodarska Vystavba](#)” and the International Training Center for the Safety of Hydrotechnical Facilities; study-tours were organized for representatives of “[Vodohospodarska Vystavba](#)” to mud dams in Medeu and Almarasan gorges, the cascade of 11 diversion power stations, the hydraulic structure of Large Almaty lake and the spaceport (October 23-24). ED IFAS took part in a regional meeting on cooperation on dam safety in Central Asia (May 1-3, Tashkent) and workshop “Exchange of experiences on dams and water structure systems safety” (October 7-11, Bratislava, Slovakia), with a study-tour to Gabčíkovo waterworks;

- The project “Ensuring security, conservation and development of fish stocks in the Northern Aral Sea region. Capacity building of the Aral-Syrdarya Basin Council” as part of TWM CA. A tripartite memorandum of cooperation was signed between the ED IFAS, GIZ, and the Akimat (Local Government) of the Kyzylorda Oblast’ (July 13, Kyzylorda). Under this memorandum the Executive Directorate installed fish saving technology at the Kok-Aral Dam. Several meetings of the Aral-Syrdarya Basin Council were held (May 17; October 24-25, Shymkent), the work for ensuring wider access to clean drinking water of remote rural communities of the Aral Sea region was undertaken, and the targeted socio-economic support for most vulnerable population groups was provided.

To raise funds ED IFAS had meetings with potential donors and prepared a project portfolio for an amount of \$2,910,890. In particular,

- a working meeting was held with managers of the WB Project “Program for regional development and revitalization of the Aral Sea basin in Kazakhstan” and as a follow up several project proposals were developed: (1) Deve-

lopment of the “green belt” along the eastern coast of the Aral Sea and human settlements, (2) Paleo-ecology of the Aral Sea region and the issues of ancient cultural landscape changes, (3) Well-grounded rationale for rehabilitation of environmental system in the Large Aral Sea (March 14, Almaty);

- “Program of international cooperation and sharing of water resources in the Syr Darya River between Kazakhstan and Uzbekistan” was developed as part of the US Department of State Program on international transboundary water cooperation;

- ED IFAS took part in an international conference on water security, new technologies, strategies, policies and institutions (September 16-18, Beijing). In turn, scientists from the Chinese Academy of Sciences visited the office of ED IFAS, the Kazakh National Water Research Institute (Taraz), the Kyzylorda waterworks facility (Kyzylorda), Aralsk, the Kok-Aral Dam, and the Research and Touristic Center “Aral” on the coast of Kamystybas Lake. Following work meetings with the representatives of the Chinese Academy of Sciences, Chinese Green Fund, UNDP, UNEP, GEF and other international organizations, project proposals were prepared: (1) Development of plantations of cost-effective plants in the Aral Sea region; (2) Improvement of biodiversity and pastoralism on the dried bed of the Aral Sea through the restoration of aquatic ecosystems; (3) Mitigation of land degradation in the Aral Sea region by fixing soil through trees and bushes grown in greenhouses.

- As part of the [Central Asia Nexus Dialogue Project: fostering water, energy, and food security nexus dialogue and multi-sector investment \(NEXUS\)](#), the Director of ED IFAS presented reports on the [regional investment projects](#) developed for the second phase of the NEXUS Project at the [4th Executive Committee meeting](#) (June 18-19, Dushanbe) and at the Closing conference (November 28, Ashgabat).

Capacity building and education. As part of its youth outreach activities, ED IFAS:

- supervised on-the-job training and writing of the diploma paper on sustainable water consumption and crop production in the Aral-Syrdarya basin of the two students from the [Narxoz University](#);

- organized, jointly with DKU, the First Aral Sea Summer School for master's students from CA, Afghanistan and Europe (August 10-18). The Summer School was organized in the area of the Syrdarya River's wet-

lands, the dried bed of the Aral Sea, and the Research and Touristic Center “Aral” at Kamystybas Lake. The work was organized around lectures on transboundary basin management, water cooperation, innovative approaches to IWRM, climate change, disaster risk reduction, ecosystems and biodiversity, as well as group work and exchanges;

- presented the report on “The role of the first Kazakh President – Yel Basy – in the development of the International Fund for saving the Aral Sea” during the plenary session of the [International scientific-practical conference](#) “The Role of the President of Tajikistan in Solving Global Problems: Water is the Source of Life”, which was held at the Al-Farabi KazNU (December 13, Almaty).

Organized events. Raising awareness of the world community about the Aral Sea problems and promotion of environmental friendliness are among the focus areas of ED IFAS. In particular, the Executive Directorate

- carried out an environmental sport campaign (February 23, Kamystybas Lake);
- organized, jointly with the branch office of the Kairat Football Club Academy and the Segizbaev Sports Club, the International football competition “The Aral Sea Cup” among children teams (March 19-24, Segizbaev Sports Club stadium);

- as part of the Aral Sea Day celebrations in Kyzylorda province and in Nur-Sultan, organized a number of thematic events: meetings at universities and colleges in the capital and in Kyzylorda; the Conference dedicated to Russian scientists’ contribution to saving the Aral Sea; campaigns for cleaning of the sea coast and planting of trees; the gala evening, including demonstration of a film about the Aral Sea, thematic exhibition and concert (March 26);
- jointly with UNDP in Kazakhstan, held the [Regional Central Asian Conference](#) “Innovative approaches and solutions in the system of sustainable water resources management and opportunities for their use in Central Asia” and issued follow-up recommendations for further cooperation (December 18-19, Almaty).

Participation in national, regional and international events. ED IFAS takes part in law-making process of the Kazakh Parliament, provides recommendations and background assessments for meetings of decision makers, actively participates in all international water commissions, and is a member of working groups at the Water Convention. In the course of the year, the leadership and experts of the Executive Directorate made reports and presentations on topical issues in the Kazakh part of the Aral Sea region at different national and international events.

Source: ED IFAS in Kazakhstan, www.kazaral.org

3.2.4. IFAS Agency for Implementation of the Aral Sea Basin and GEF Projects

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 of the GEF Agency of IFAS in 2019

On development of ASBP-4 and institutional and legal improvement of IFAS. As a member of the Uzbekistan’s national work group, the Agency took part in: drafting project proposals for ASBP-4 and proposals on the institutional and legal improvement of IFAS; 2nd (July 30-31, Ashgabat) and 3rd (November 25-26, Ashgabat) meetings of RWG on the development of ASBP-4 and the improvement of IFAS. Following this work, the composition of ASBP-4 including 34 regional projects was approved.

The **project activities** are carried out together with the Nukus branch of EC IFAS through the state budget of Uzbekistan as its contribution to IFAS and the donor’s grants.

The work was continued on the Project [“Construction of small local water bodies in the Amu Darya Delta. Phase II”](#). The Nukus branch of EC IFAS signed the contractor agreements with the “Kuprikkurilish” Trust for implementation of work on the “Reconstruction of a road dam along Maipost Lake and construction of an over-

flow structure on the Amu Darya River (Akdarya) together with measures to prevent canyon formation processes in Domalak Lake". 140.7 billion soum (about 30% of the total cost of structures) were utilized in 2019.

In line with Resolution 37 of the Cabinet of Ministers of 16.01.2019 "On measures for comprehensive socio-economic development of Muynak district in the Republic of Karakalpastan", the Nukus branch of EC IFAS implements the following projects:

- "Reconstruction of the Muynak Canal" as part of the "Construction of small local water bodies in the Amu Darya Delta. Phase II". It is planned to reconstruct the existing 21.3 km long earthen channel and construct a new section of the channel 3 km long to pass 44.3 m³/s;
- "Provision of irrigation water for the homestead plots (65 ha) of the Muynak city through a pressure pipeline network composed of 250 mm diameter polyethylene pipes";
- "Construction of a protective dam at the Muynak airport and the subsurface horizontal drainage".

The work was continued also on the following projects:

- "Protective afforestation in Akhantai site" and "Protective afforestation in Akkum ridge" using local trees and shrubs;
- "Monitoring of wetland biodiversity in the South Aral region". Two expeditions were organized (in August and September) to wetlands in the South Aral region with a view of assessing biota trends. The environmental monitoring of biodiversity was conducted in lakes Sarbas, Sudochie and Domalak;
- "National water resources management in Uzbekistan" (SDC). The target training was conducted to build capacities of the Information-Analytical and Resource Center at the Ministry of Water Management of Uzbekistan; ICT-based tools (website, online water monitoring portal and mobile application "Tomchi" (in Uzbek, meaning drop) were launched, and construction of water measuring and regulating structures was completed in 6 plots of

field farmer schools and laser leveling was made; additionally, the training for managers of 152 district irrigation divisions was held together with the Ministry of Water Management. Negotiations on Project Phase II were started.

Requests from the Government of Uzbekistan and the republican ministries and departments.

Assistance was provided for preparation of documents, policy briefs, notes and reports, also regarding the Aral Sea problem. Proposals were drafted on the promotion and implementation of the initiatives put forward by the Republic of Uzbekistan at the SCO Summit (June 14, Bishkek) and information was prepared on progress of the Road Map for implementation of initiatives voiced by the President of Uzbekistan at XII Summit of the Heads of IFAS Founder-States. The Agency also rendered assistance to the MPHSTF for the Aral Sea region.

Political participation. The Constitutive Congress of the Ecological Party of Uzbekistan was held in Tashkent on the 8th of January to endorse the party program, charter and logo and elect the party's governing body. The Head of the GEF Agency of IFAS Mr. Sokolov was elected a member of the Political Council. Seven representatives of the Agency also entered the membership of the Ecological Party.

Charity. The GEF Agency of IFAS provided grants for events organized by the Ecological Party. Those included festive events for the Day of Nature Protection (June 4, Gafur Gulyam recreation park) and the 40th Festival of songs (June 15, Chimgan). The Agency also allocated funds to Uzbekkino (national film studio) for production of a documentary titled "The Aral Sea is the pain of mine", including contribution to the scenario concept (together with OOO "Sintez Film", director M. Abdukhalikov) and assistance in film production ranging from expert consultations, provision of relevant materials to the support in field visits to the Aral Sea region and the exposed bed of the Aral Sea.

Public outreach. Answers were prepared to citizen appeals submitted to the virtual office of the President of Uzbekistan concerning the problems of the Aral Sea and meetings were held to discuss proposals offered by the authors of appeals.

Capacity building and education. The Agency rendered assistance in compilation of a questionnaire for a competition on IWRM as part of

cooperation with DKU, took part in the judging panel at the initial stage at TIIAME. The presentation "Scientific grounds of ecosystem recreation around the western body of the Aral Sea and pre-feasibility study of tourism promotion in this zone" was made on behalf of the Agency during the International youth forum "100 Ideas for the CIS" (November 14-15, Baku).

Experts of the Agency A. Tulyaganov and A. Abzalov took part in the training course "Integrated approach to climate change policy development and financing for effective implementation of SDG goals" organized by the Environment Protection Training and Research Institute of India with the support of the MFA of India (March 18-30, Hyderabad, India).

Regional and international cooperation. The Agency took efforts to attract attention of representatives of the international community and donors to the water and environmental problems in the region, the initiative of the President of Uzbekistan on declaring the Aral Sea region as a zone of environmental innovations and technology, and the regional water conservation program in Central Asia.

GWP – GEF Agency of IFAS. The Agency hosts the National Water Partnership of Uzbekistan and assists in organization of joint events. Two roundtables were held on the progress in implementation of integrated water resources management in Uzbekistan (March 29, Tashkent) and on the results of the International High-Level Conference "Aral Sea Region – Zone of Environmental Innovations and Technologies" (December 5, Tashkent).

Asia Water Council (AWC). During the 3rd AWC General Assembly the Head of the Agency V. Sokolov was elected the Chairman of the Council's Special Committee on Water-Energy-Food Nexus and the member of the new AWC Board for 2019-2021 (March 14, Manila, Philippines). At the 10th meeting of the Board of Council the GEF Agency of IFAS presented new initiatives for the Aral Sea put forward by the President of Uzbekistan (September 23-24, Wuhan, PRC). Thanks to active involvement of the Agency in the Board of Council, one of thematic sessions

of the 2nd International Asia Water Week to be held on 12-15 October 2020 in Bali, Indonesia will be dedicated to innovations in the Aral Sea basin.

The Agency held numerous meetings with the experts of international agencies and organizations (SDC, KOICA, etc.), UNECE delegation, group of young specialists from Afghanistan, the ADB mission on the new Climate Adaptive Water Resources Management in the Aral Sea Basin Project, the Director of UNDP Representative Office in Uzbekistan Ms. Matilda Dimovska, representative of EIB Mr. Umberto Del Panta, representative of the Spanish company "Ambienta Engineering Services Ltd." and others.

Republican and international events. Jointly with partners, the Agency held a number of international and regional events that attracted attention of the world community to the problems of the Aral Sea and the Central Asia as a whole.

Media outreach. Events organized by the Agency were covered in media and Internet. These included in particular: an interview on the further strategy for rehabilitation of the Aral Sea region in Karakalpakstan (January 6); video-review³: students plant trees to save what's left of the Aral Sea (April 9); interview on the current situation on the exposed bed of the Aral Sea and in the Aral Sea region and the Uzbekistan's initiatives (May 8, news-portal "Habar 24"⁴); interview on the measures taken in Uzbekistan to overcome the Aral Sea problem⁵ (July 19, newspaper and Internet edition "Ishonch-Doverie"), etc. The efforts undertaken were also covered by republican channels, such as "Uzbekistan 24", "Yoshlar", "Sreda.uz", etc., as well as by channels of Karakalpak and Khorezm TV.

The Agency's website www.aral.uz is updated regularly, and a number of research papers, reports, brochures and books were published (<https://aral.uz/wp/category/newspaper/>; <https://aral.uz/wp/publications/p3/>).

Source: GEF Agency of IFAS;
<https://aral.uz/wp/about/>

³ Euronews: <https://www.euronews.com/2019/04/08/watch-students-plant-trees-to-save-what-s-left-of-the-aral-sea>

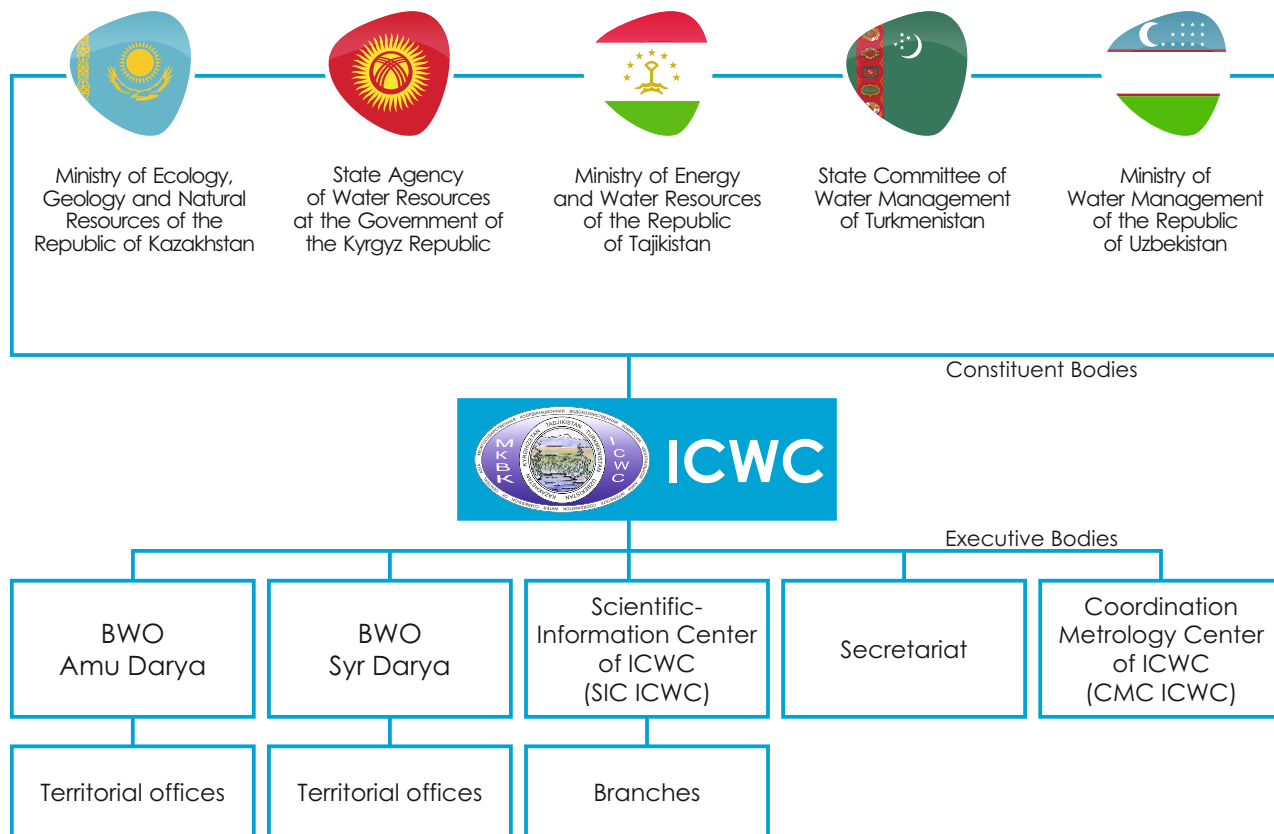
⁴ <https://24.kz/ru/news/in-the-world/item/313566-k-realizatsii-programmy-po-spasenyu-aralskogo-morya-pristupili-v-uzbekistane>

⁵ <http://ishonch.uz/ru/2019/07/19/не-оставаться-равнодушными-к-катастро>

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 from the interstate sources of the Aral Sea basin and implements jointly developed programs on the basis of cooperation and mutual respect for the parties' interests. The Commission was formed on 18 February 1992. The organizational set-up of ICWC is shown in the figure below.



3.3.1. ICWC meetings

In 2019, ICWC held two meetings: 76th (April 19) in Tashkent and 77th (November 5) in Almaty. ICWC members from Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan⁶, 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.

Issues addressed

The main items on the agenda of the meetings were the **limits of water withdrawals and the operation regimes of reservoir cascades in the Syr Darya and the Amu Darya basins**. The Commission summarized the results on the abo-

ve items in the non-growing season 2018-2019 and the growing season 2019.

The limits of water withdrawals for both river basins and the forecast operation regimes of reservoirs in the Amu Darya basin were approved for the **growing season 2019**. On the Syr Darya basin, representatives of Uzbekistan, Kazakhstan and Tajikistan agreed on a joint meeting in early June to make a decision on provision of needed inflow at the Akjar gauging station and water releases from the Bakhri Tojik reservoir in summer 2019. Before the meeting, the parties should have to consider the receipt of electricity from Kyrgyzstan and Tajikistan in June-August.

⁶ Since the 68th meeting, representatives of the Kyrgyz Republic have not taken part in ICWC activity

Reforming national water agencies in 2018-2019



**Ministry of Agriculture
of the Republic
of Kazakhstan**

Decree of the
Government
No.17
of 17.06.2019

**Ministry of Ecology,
Geology and Natural
Resources of the
Republic of Kazakhstan**



**Ministry of Agriculture,
Food Industry and
Land Reclamation
of the Kyrgyz Republic**
*Department of
Water Resources and
Land Reclamation*

Resolution of
the Government
No.383
of 30.07.2019

**State Agency
of Water Resources
at the Government
of the Kyrgyz
Republic**



**Ministry of Agriculture
and Water Management
of Turkmenistan**

Decree of the
Government
of 29.01.2019

**State Committee
of Water Management
of Turkmenistan**



**Ministry of Agriculture
and Water Management
of the Republic
of Uzbekistan**

Decree of the
Government
No.UP-5330
of 12.02.2018

**Ministry of
Water Management
of the Republic
of Uzbekistan**

ICWC members in 2019



**Yerlan
N. Nysanbayev,**
Vice-minister
of Agriculture

**Sergey
N. Gromov,**
(since August 14, 2019)
Vice-minister
of Ecology,
Geology and
Natural Resources



**Sulton
N. Rakhimzoda,**
First Deputy
Minister of Energy
and Water Resources

**Usmonali
Yu. Usmonzoda,**
(since May 6, 2019)
Minister of Energy
and Water Resources



**Magtymguly
Bairamdurdiyev,**
Deputy Minister
of Agriculture
and Water Management

**Annageldy
O. Yazmyradov,**
(since February 1, 2019)
Chairman of the
State Committee
of Water Management



**Shavkat
R. Khamraev,**
Minister
of Water
Management

**Joshmyrat
Sedekov,**
(since September 23, 2019)
Acting Chairman
of the State
Committee of
Water Management
(temporary appointed)

During the meeting aimed at discussion of operation regimes of the Bakhri Tojik reservoir for July-August 2019, the parties have agreed on (1) dates, volume and procedures for energy supplies from Tajikistan to Kazakhstan and back; (2) dates and volumes of water releases from the Bakhri Tojik reservoir to be provided by the Tajik party; (3) amount of inflow to be provided by the Uzbek party to the Bakhri Tojik reservoir from NFC [Northern Fergana Canal] and BFC [Big Fergana Canal] and maintenance of water level in the Farkhad reservoir.

The Kazakh and Uzbek parties have also agreed on water supply along the Dustlik Canal to Kazakhstan.

Read more in the [Minutes of the working meeting \(June 5\)](#).

were approved for the **non-growing season 2019-2020**.


The 76th meeting of ICWC considered **participation of the members and executive bodies of ICWC in the development of ASBP-4**. It was recommended to EC IFAS to include project proposals finalized by SIC ICWC in line with the comments of ICWC members into the list of ASBP-4 regional projects. The executive bodies were tasked to take part in the 2nd meeting of RWG on the development of ASBP-4 and the legal and institutional improvement of IFAS.


At the 77th meeting, SIC ICWC presented **information on implementation of the proposals and initiatives of the Heads of IFAS founder-states voiced at the XII Summit of the Heads of IFAS Founder-States**. It was decided that ICWC members and its executive bodies should take necessary measures at the national and regional levels for more active implementation of the proposals and initiatives of the Heads of State as reflected in the joint Communiqué.


The forecast limits of water withdrawals and operation regimes of the reservoir cascades


3.3.2. Activities of ICWC Executive Bodies in 2019


Executive bodies of ICWC

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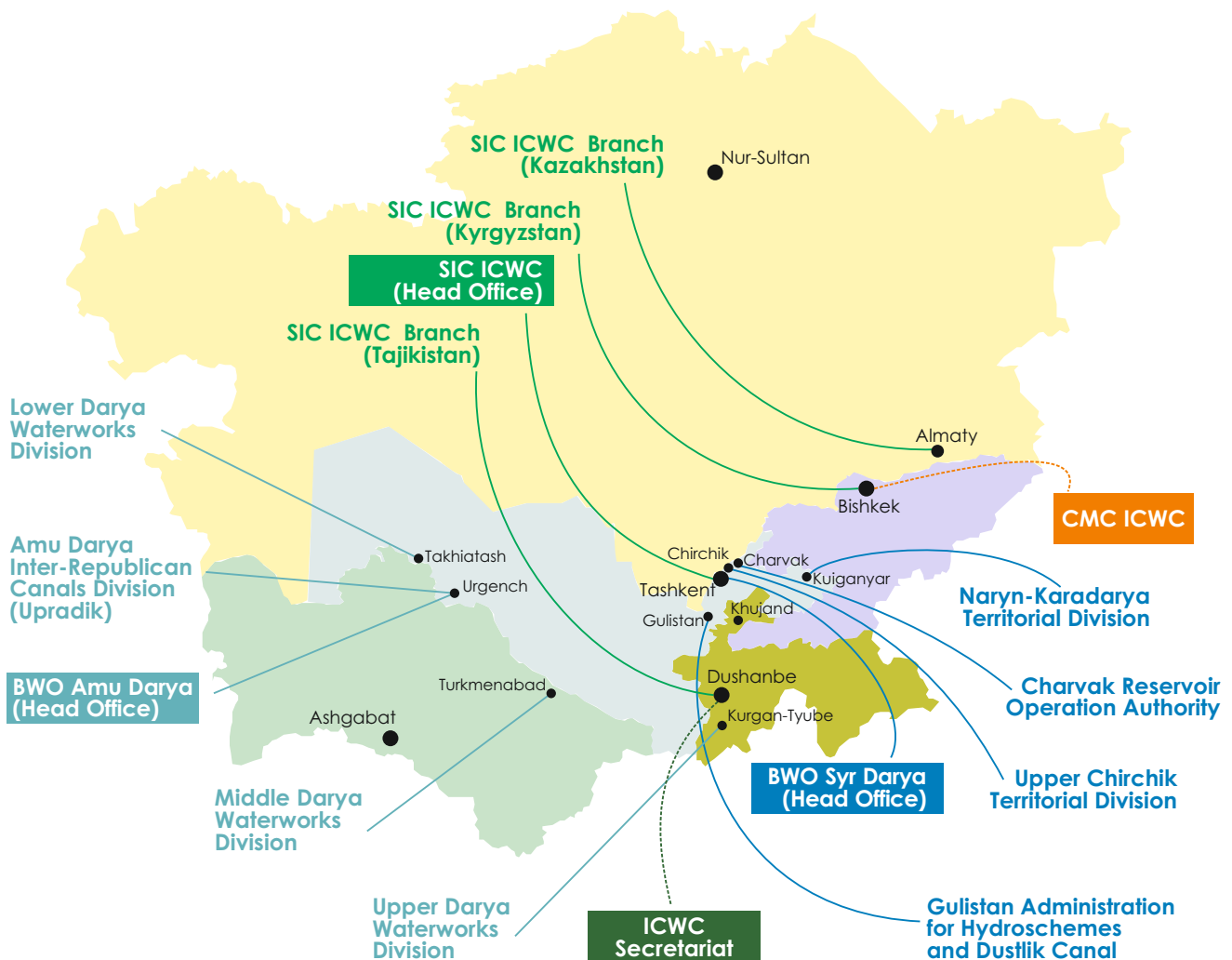
BWO Syr Darya Responsible for routine management and distribution of water resources among the riparian states, timely and reliable delivery of water, according to the agreed limits, to users, and provision of sanitary and environmental flow for Prearalie and the Aral Sea. Established in September 1,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

Location of Executive Bodies



BWO Amu Darya

Activity of BWO Amu Darya in 2019

In 2019, BWO Amu Darya continued working on interstate water allocation and real-time control over observance of the established water withdrawal limits approved at the ICWC meeting (see "[Water management situation in the basins of the Amu Darya and the Syr Darya](#)"), on modernization and operation of waterworks facilities that are under responsibility of BWO, and prepared materials for and participated in two ICWC meetings (see "[ICWC meetings](#)") and 12 meetings of water management organizations responsible for the river's lower reaches on the issues of water allocation.

BWO Amu Darya maintained cooperation with EC IFAS, national water agencies of Turkmenistan, Tajikistan and Uzbekistan, national hydrometeorological services, SIC ICWC,

CAREC, GIZ and IWMI. Representatives of BWO Amu Darya and its territorial branches took part in regional programs, conferences, and training workshops. In particular, with the support of GIZ, training was organized for BWO's staff on how to handle the web-site of BWO Amu Darya and the software for evaluation of snow cover in the catchment area of the Amu Darya.

As part of the [Central Asia Nexus Dialogue Project: Fostering Water, Energy and Food Security Nexus Dialogue and Multi-Sector Investment](#) (NEXUS), specialists of BWO Amu Darya took part in the development of project proposals for ASBP-4 and in a study tour "Management of the transboundary water resources in Danube and Sava River Basins" to learn more about the water, energy and food security nexus (May 13-17, Vienna, Austria and Zagreb, Croatia).

Source: BWO Amu Darya, <http://amudarya-bwo.org/>

BWO Syr Darya

Activity of BWO Syr Darya in 2019

ICWC meetings. BWO Syr Darya took active part in organization of the two ICWC meetings (see "[ICWC meetings](#)"), fulfillment of decisions and assignments of ICWC. The reports on forecast and actual operation regimes of the Naryn-Syrdarya cascade of reservoirs and the limits of country water withdrawals for the non-growing season 2018-2019 and the growing season 2019 were submitted for consideration and approval.

Development of ASBP-4. The regional project proposals were drafted for consideration at the 4th Executive Committee meeting under the NEXUS Project (June 18-19, Dushanbe). Finally, the Project "Modernization and automation of water management system and sustainable operation of interstate waterworks facilities in the Syr Darya basin" and the Project "Safety of dams and other waterworks facilities in Central Asia: capacity building and regional cooperation" were selected and included into ASBP-4.

Repair and rehabilitation operations. The following structures were repaired: two gates at the head structure of the Lower Dalverzin canal; gates at 26 km (offtake) and 39 km of the Dustlik canal; gates of lift mechanisms at the structure of the Lower Big Andizhan canal. The slopes of the Dustlik canal were rehabilitated; canals and structures were mechanically cleaned.

Reconstruction and modernization. The following operations were completed: construction of the spillway face, concrete coating of right and left slopes of the head-water of Kuyganjar hydroscheme⁷; dolosses were installed and 11 gates at the dam were replaced. Construction of a protection structure downstream of the dam is planned for 2020. As a result of reconstruction of Kuyganjar hydroscheme, irrigation of 230,000 ha in the Fergana Valley will be improved.

Construction operations were completed as part of the "Protection measures at BWO's structures of Upper Chirchik hydroscheme".

Surveys were completed, design specifications and estimates were made and expertise was finished on the "Reconstruction of the tail-water of the head structure at Northern Fergana canal in Uchkurgan district, Namangan provin-

ce", "Reconstruction and modernization of the head structure at DP 145+00 of South Golodnostepskiy canal in Shirin town, Syrdarya province", "Reconstruction and modernization of mechanical equipment of Kuyganjar hydroscheme", and "Reconstruction and modernization of the head structure of Dustlik canal".

Automation of gauging stations in the Syr Darya basin. As a follow-up to initiatives of the President of Uzbekistan voiced during XII Summit of the Heads of IFAS Founder-States, BWO Syr Darya jointly with SIC ICWC, UzHydromet and other concerned organizations developed terms of reference and completed examination of structures in upper and middle reaches of the Syr Darya River, the results of which served as an input for recommendations on the feasibility study and the detailed design for implementation of the SCADA system.

"Smart Water" system. With the financial support of KOICA and assistance of the Uzbek Ministry of Water Management the Smart Water system's equipment was installed at 11 structures to measure water discharge and quantity and transmit the data online. The territorial branches of BWO made ground work for installation of the Smart Water system and energy supply of the structures.

Source: BWO Syr Darya, http://www.icwc-aral.uz/bwosyr_ru.htm

ICWC Secretariat

Activity of the Secretariat in 2019

In 2019, the 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's staff also assisted in organization of events held by the Tajik Ministry of Energy and Water Resources. In particular, the training workshop "Empowering women in water and sanitation in the Republic of Tajikistan" was organized (September 4-5, Dushanbe). The workshop brought together the representatives of the Ministry of Energy and Water Resources, the Agency of Land Reclamation and Irrigation at the Government of Tajikistan, the Nature Conservation Committee, and the Committee for Women and Family Affairs.

Source: ICWC Secretariat

⁷ Kuyganjar hydroscheme was built at the Karadarya River in 1939. The carrying capacity is 1,210 m³/s. The hydroscheme was damaged as a result of strong flood in 2010

Scientific-Information Center of ICWC

Activity of SIC ICWC in 2019

Evaluation of ASBP-3 performance, development of ASBP-4 and institutional and legal improvement of IFAS. SIC has recommended developing ASBP-4 based on the activities that were not fully implemented in ASBP-3. During chairmanship of Kazakhstan (2008-2013) and Uzbekistan (2013-2016) in IFAS, only 14 regional projects were completed or launched out of 50 ones envisaged in ASBP-3. By the moment when EC IFAS moved to Turkmenistan, the Government of Uzbekistan had approved and got financial support from ADB for the Amu Darya Water Resources Management Project. However, the opportunity was missed and the project proposal was not included into the ASBP-4 package.

As part of preparation of ASBP-4, SIC submitted the regional projects that got approval of ICWC members and the key water management issues as the focus areas to guide selection of projects for ASBP-4 to EC IFAS. SIC took part in the 2nd meeting of RWG on the development of ASBP-4 and the improvement of IFAS (July 30-31, Ashgabat). As a follow-up to the 2nd meeting, the feedback was submitted to EC IFAS concerning (1) the project proposals of ASBP-4 prepared by RWG members and (2) the institutional and legal improvement of IFAS.

ICWC Working Groups. According to a decision of the 73rd meeting of ICWC, the Kazakh Ministry of Agriculture, BWO Amu Darya, BWO Syr Darya and SIC ICWC have set the list of actions to be done as part of the “2018-2019 Work plan of ICWC working groups” and updated the membership in the working groups.

In 2019, SIC ICWC worked in the following four directions:

1 Water conservation. Prepared and published “Methodology for scheduling of water use and water delivery for farms”.

2 Implementation of integrated water resource management and adaptation to climate change. Prepared “Proposals on further development of basin councils at BWO Amu Darya and BWO Syr Darya and their territorial branches” and disseminated among the members of the working group from BWO Amu Darya, BWO Syr Darya and the Kazakh Ministry of Agriculture for the feedback. Published “Review of basin councils in the world and their prospects for Central Asia” (SIC ICWC Research Papers, issue 2).

3 Improvement of water accounting quality and accuracy. (1) Jointly with the member of the working group from BWO Syr Darya, completed examination of the technical conditions of structures in upper and lower reaches of the Syr Darya, including the Chirchik River basin. Accordingly, proposals for the development of feasibility study for automation and for the detailed design of implementation of the SCADA system in middle reaches of the Syr Darya in the Uzbek territory were drafted; (2) The analysis of discharge measurements at gauging stations of BWO Amu Darya was made and showed that all stations have more than 5% measurement error. The causes are the high turbidity of the Amu Darya and siltation of level gauges and the gaps in calibration of gauging stations (more than 25-30 years), with consequent huge discrepancies in water balance. The terms of reference was prepared for examination of the set of structures at the Tuyamuyun reservoir for the following development of a feasibility study on automation of this waterworks facility.

4 Building capacity of regional and national organizations. The following brochures were prepared: “Water resources management in Israel, India and Iran”, “Experience of regulation of water relations among the EU countries”, and “Enhancement of water cooperation between regional and national organizations in Central Asia” (SIC ICWC Research Papers, issue 5).

Organizational and technical activity. SIC together with other bodies of ICWC took part in organization of the two meetings of ICWC (see “[ICWC meetings](#)”), fulfillment of decisions and assignments of ICWC. SIC has developed analytical reports on the water-related situation in the region for growing and non-growing seasons. The work was continued on the analysis of the status in the South Aral region and the Aral Sea, including monthly estimations of the inflow from the Amu Darya River and collecting drains and the changes in the water surface and wetland area in Eastern and Western parts of the Aral Sea and lake systems of the Amu Darya Delta using Landsat 8 OLI imagery (http://www.cawater-info.net/araldata/monitoring_amu.htm) (see “[Monitoring of Changes in the Water Surface and Wetland Area of the Large Aral Sea and the Amu Darya Delta](#)”).

SIC ICWC took part in the follow-up activity to the Joint Communiqué adopted at the Summit of the Heads of IFAS Founder-States, implementation of the CA country presidents' initiatives. Technical, information and expert assistance was rendered to **national and regional organizations** through timely provision of relevant

materials on their request. In particular, the following information and analytical contributions were made to:

- **fulfillment of decrees of the President and the Cabinet of Ministers of Uzbekistan:** “On measures for further improvement of the water management system” (PP-4486 of 09.10.2019), “On approval of the concept of environmental education in the Republic of Uzbekistan” (Decree of CM RUz No. 434 of 27.05.2019, Instruction of CM RUz on implementation of initiatives and proposals of the President of Uzbekistan voiced at XII Summit of the Heads of State (965-F of 16.11.2018);

- **draft documents:** WB’s Concept on the strategy of agricultural development modernization in Uzbekistan by 2030; State Program “The Year of active investments and social development”; “The concept of water development in the Republic of Uzbekistan for the period up to 2030”; Law of RUz on land reclamation; Decree of the President of Uzbekistan “On the improvement of provision of water services to users and consumers”; “National concept of environmental conservation in the Republic of Uzbekistan for the period up to 2030”; “Concept of the SPECA Strategy on water, energy and environment” (UNECE); draft Concept of the State Program of Water Resources Management in Kazakhstan for 2020-2030;

- **organization of water accounting in the basins of the Amu Darya and the Syr Darya** and ensuring of sustainable water supply for the Amu Darya delta and all its lakes;

- **issue related to transfer of a portion of the Siberian river flow to CA:** opinion of SIC ICWC regarding the viability of the topic of the flow transfer project; note on prospects of the project, given the interests of Russia, Europe and CA; paper of Prof. V.A. Dukhovniy “Concerning redistribution of a portion of the Siberian river flow to the Aral Sea basin”. Prof. Dukhovniy made a report on flow transfer at the International Conference of EECCA NWO “[Science and Innovations for Water Security](#)” (September 23-27, Yekaterinburg) and at the Regional Central Asian Conference on “[Innovative Approaches and Solutions in the System of Sustainable Water Resources Management and Opportunities for their Use in Central Asia](#)” (December 18-19, Almaty);

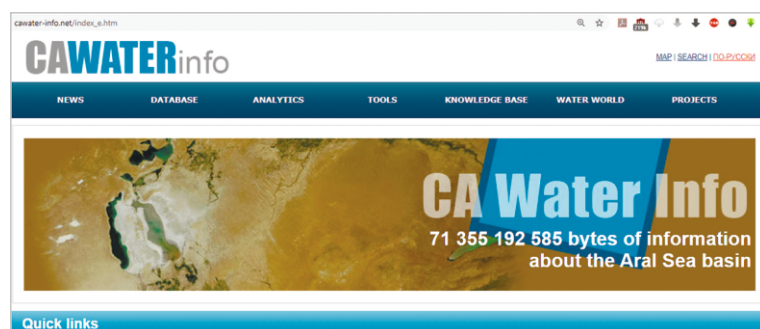
- **issue related to the development of cooperation between CA countries and Afghanistan:** a note regarding a potential increase in water withdrawals by Afghanistan in the near

future and the development of water cooperation between the CA countries and Afghanistan for the improvement of general awareness, searching consensus and mutual benefits.

Information and analytical activity. The regional database is populated with the key information on all countries of the Aral Sea basin up to 2018. The databases on the Amu Darya and the Syr Darya basins were updated on ten-day basis (jointly with BWO Amu Darya and BWO Syr Darya); the database on the Surkhandarya River basin and access to the knowledge bases on the Amu Darya (www.cawater-info.net/amudarya-knowledge-base/) and the Syr Darya basins (www.cawater-info.net/syrdarya-knowledge-base/) were opened. The assessment of the forecast inflow to Toktogul, Andizhan and Charvak reservoirs and to Kelif gauging station was published for the growing season 2019. The morphometric characteristics of the Aral Sea over 2007-2018 were added to the database. The analysis of the current water development in the Amu Darya River basin was published on the website as well.

Information and publications. In 2019, the information support of activities of ICWC and its executive bodies was further provided through publications and the Regional Information System on Water and Land Use in ASB (CAWater-Info), analytical tools and models, data and knowledge bases, regional web-resources, including the CA water and environment knowledge portal (CAWater-Info), ICWC, SIC ICWC, and EECCA NWO web-sites, as well as the ASB management model (ASBmm) and the WUEMoCA tool.

The knowledge base “Water in Central Asia” was populated with 1,324 new entries, such as monographs, research papers, manuals, references and other publications (www.cawater-info.net/bk/). Atlas of water-management and environmental organizations in the EECCA countries was updated.



<http://www.cawater-info.net/>

27 [publications](#) on water management and law were issued and disseminated in paper- and e-format (see "[Publications in 2019](#)"). A new series of publications - "SIC ICWC Research Papers" (issues 1-4) - describing research made by SIC's experts and partners was launched.

Project activity. In 2019, SIC:

- Continued work on the project "[Support to the Network of Russian speaking water management organizations](#)" with the support of UNECE. SIC organized the International EECCA NWO Conference "Science and Innovations for Water Security" (September 23-24, Yekaterinburg). Collections of scientific papers titled "Science and Innovations for Water Security" (volumes 1 and 2) and "Selected transboundary water agreements signed between European and Asian states over 1992-2019" were issued; the knowledge base of the CAWater-Info portal as one of the sources of knowledge of EECCA NWO was populated, including in English.

- Completed the CAWA-3 (Regional Research Network "Water in Central Asia") Project. In particular, the yield forecast model was adapted for the Fergana Valley conditions and validation of RS-based data was made. The monthly data on actual water delivery to irrigated land was collected at district level of ASB (19 districts in Kazakhstan, 11 districts in Kyrgyzstan, 33 districts in Tajikistan, 37 districts in Turkmenistan, and 157 districts in Uzbekistan) over 2018 in CAREWIB database. The data on 156 Uzbek districts and provinces over 2000-2017 were validated. The validation showed that the RS-based data fit the actual data. The ten-day data on irrigation water delivery were collected and analyzed for the growing seasons (April-September) on 154 districts of Uzbekistan. The comparison of crop acreages for all provinces in the Aral Sea basin was made with WUEMoCA model results for 2000-2018. Finally, the second WUEMoCA ("Water Use Efficiency Monitor in Central Asia") [User Forum](#) and the WUEMoCA hands-on training were held (November 7-8, Tashkent).

- Issued four Aral Sea Basin Transboundary Water Early Warning Bulletins (March-July) as part of the UNRCCA project. The Early Warning Bulletins show the actual situation in the Amu Darya and the Syr Darya basins for the current month and the forecast for the next month. The Bulletin is a resource, which provides all the Central Asian states and their international partners with improved capacity to monitor regularly the status of transboundary rivers and warn early of potential issues that require attention.

- Compiled and published, with the support of UNRCCA, the Water Yearbook: Central Asia and around the Globe in Russian and English. The 2018th edition contained summary of key water developments in CA and all over the world. OSCE provided financial support for publication of additional copies of the Yearbook.

- Completed "Evaluation of farming activities supported by climate sub-loans in Tajikistan and Uzbekistan" as part of the contract with CAREC under the "Climate Adaptation and Mitigation Program for the Aral Sea Basin" (CAMP4ASB). A simple and quite reliable form of preliminary quantitative assessment of farming activity resilience to climate change was developed and can be used by national coordination groups (NCG), local banks and farmers in Tajikistan and Uzbekistan. The concept of regional online database on climate-smart farming methods and technologies was developed. Based on the project results, the training workshops were held for experts of NCGs, credit specialists of local banks and farmers on the methodology of quantitative assessment of resilience to climate change ([Tajikistan](#) – June 18-19; [Uzbekistan](#) – June 26-27).

- Implemented the project "Studies for clarification of the river balance items of the Syr Darya and its main tributaries and development of a computer program" (upon contract with BWO Syr Darya). The relevant input information was collected and analyzed for the periods of 1975-1985 and 1991-2018. The methodology for calculation of river balance items was developed and tested in the pilot reach from the tailwater of Bakhri Tojik reservoir to Farkhad waterworks facility.

- Prepared the Diagnostic Report on Rational Use of Water Resources in Central Asia for the assessment of progress made in implementation of the 1998 Central Asia Regional Water Strategy and the provision of recommendations for a future strategy. The database containing key indicators and information was developed as well (contract with OECD).

- Updated the publication "Aral Sea and the Aral Region" (by the data and information over 2015-2018) and translated into English as part of the contract with UNESCO.

- Jointly with the International Innovation Center of the Aral Sea Region, undertook the scientific expedition (September 20-October 20) to study conditions of the salinized land in the Aral Sea region and the exposed bed of the Aral Sea as part of the contract with UNDP under the

MPHSTF Project “Addressing the Urgent Human Insecurities in the Aral Sea” (see “[UNDP in Uzbekistan](#)”). The study area covered 600,000 ha: from Ustyurt cliff to the channel of the Amu Darya, from the historical water level of 53 m BSL to the current water edge. The expedition traveled 7,500 km and described 1,580 points for identification of satellite images. The following work was done: soil description by 35 profiles, with identification of soil types; monitoring of the operational hydrological network; measurement of water table; environmental assessment of the territory. The scale of self-organized vegetation was assessed. The second expedition is planned for spring along the route from the channel of the Amu Darya to Kokdarya. The expedition’s results are described in the “[Results of the expedition to the exposed bed of the Aral Sea in September-October 2019](#)”.

Capacity building and training

Lecturing. SIC’s experts were invited as lecturers to: vocational training courses for managers of Basin irrigation system administrations, with the support of the Ministry of Water Management of Uzbekistan (January 14-18, TIAME); lectures “Transboundary water management in the Aral Sea basin” for master students of the Nazarbayev University Graduate School of Public Policy (August 29, videoconference); workshops for the staff of WUAs and water-management organizations organized by the EXPERT INFO Consulting agency as part of the Horticultural Support Project in the Republic of Uzbekistan (October 21-30, Surkhandarya province).

In the course of the academic year, SIC’s experts delivered lectures and hands-on training on the following subjects: “Statistical methods in hydrology and the basics of mathematical modeling”, “Hydrology of irrigated land”, and “Reclamative hydrology” for students of the Uzbek National University’s Geography and Natural Resources Faculty; “Hydraulics (hydrostatics and hydrodynamics)” for students of the Hydrotechnical Melioration Faculty and “International and national water relations and law” for master students of the Ecology and Water Management Division at TIAME.

SIC ICWC organized and held (1) the International Conference of EECCA NWO “[Science and Innovations for Water Security](#)” (September 23-27, Yekaterinburg); (2) WUEMoCA (“Water Use Efficiency Monitor in Central Asia”) [User Forum and hands-on training](#) for the specialists of water

agencies of CA countries and BISAs of Uzbekistan (November 7-8, Tashkent).

The expert of SIC ICWC Mr. I. Ergashev was a member of the State Examination Board of TIAME on thesis protection for bachelor’s degree on “Water Management and Land Reclamation” (June 12-24). The Deputy Director of SIC ICWC Dr. D. Ziganshina chaired the Graduate Admissions Office of TIAME, took part in organization of the national academic competition “Integrated water resources management” (May 20), and participated in a meeting with master students on the program “Water cooperation and diplomacy”, which was delivered in three universities: University for Peace in Costa Rica, Oregon University in USA, and IHE-UNESCO in the Netherlands (February, Delft). She also participated in the workshop “Water and Diplomacy” organized by the Embassy of Canada in Uzbekistan and the University of World Economy and Diplomacy (November 22, Tashkent). The Director of SIC ICWC Prof. V. Dukhovniy took part in a meeting with students from TIAME and other universities in Tashkent dedicated to “Water in Central Asia” (November 20, Navoiy National library of Uzbekistan).

Training courses. The curriculum of vocational training in GIS and RS was developed for the staff of land reclamation field offices and got approval by the Land reclamation department of the Uzbek Ministry of Water Management. The online training course “Water management at the level of WUA and farm” was developed as well (<http://mooc/tuit.uz>).

Web-site of the ICWC Training Center. The web-site developed by SIC in 2018 was further developed and populated with the materials of training courses, reports and publications (<http://www.cawater-info.net/training/index.htm>).

Internship at SIC ICWC. As part of capacity building, the 3rd year students of the Geography and Natural Resources Faculty at the National University of Uzbekistan (22.07.19-16.08.19) and a master student on “Environmental security aspects in the water sector” of TIAME (27.08.19-27.09.19) have got practical training at the Center.

SIC staff improved its qualifications through different courses, workshops, and trainings. SIC’s experts published 24 papers.

International cooperation. SIC kept maintaining cooperation with embassies, international organizations and financing institutions and took part in activities of UNECE, WWC, ICID, GWP, INBO and IWRA.

In 2019, SIC ICWC signed the Memorandum of Understanding with the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences (IGSNRR CAS) (September 17) and the Memorandum of Cooperation for support of research in the area of water use and protection regulation, ecology, water management and agriculture with the International Innovation Center of the Aral Sea Region (October 25). SIC had a number of work meetings, including with the Ambassador of Germany in Uzbekistan, the representatives of ADB, the US Embassy in Kazakhstan, the group of experts from IGSNRR CAS, GIZ, the experts of EBRD, the National Forestry and Grassland Administration of China, specialists of Spanish com-

panies Ambienta Engineering & Services Agrarios y Forestales S. L. and TYPASA, etc.

SIC took an active part in activities of working groups, preparation of discussion notes, reports, and presentations and in organization of international events and publication of materials.

SIC continued disseminating the Russian versions of materials of WWC and INBO in the EECCA countries (INBO Newsletter, International News of IOWater); maintained the [web-site](#) of the EECCA NWO and Russian versions of [WWC](#), [INBO](#), and [IOWater](#).

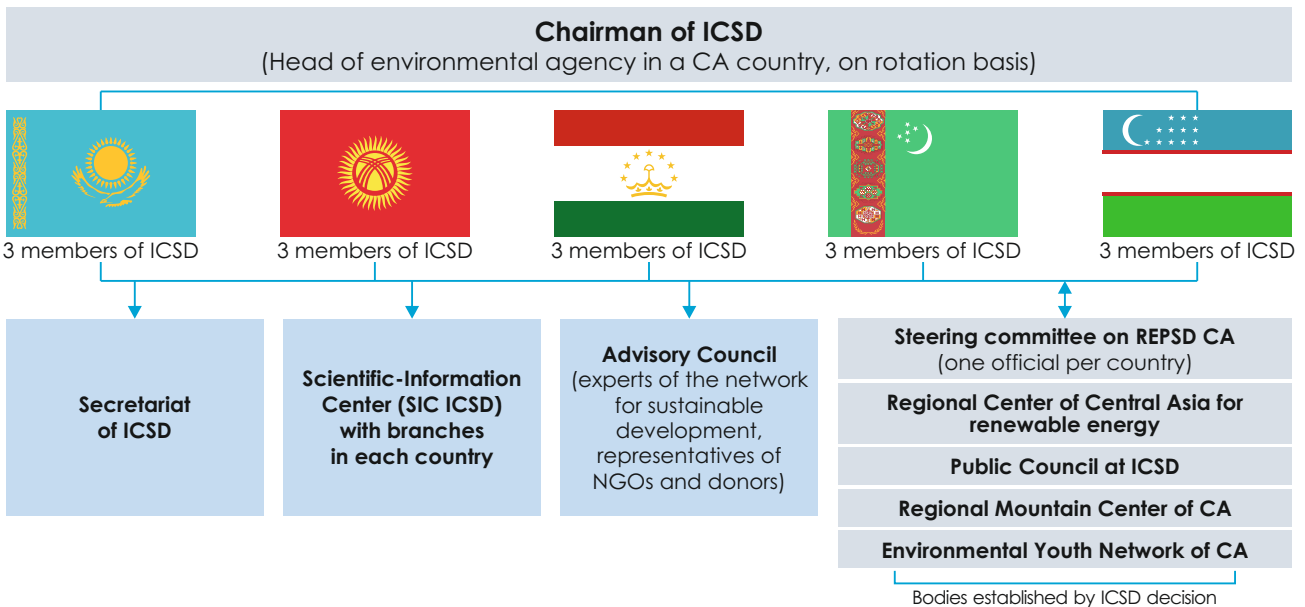
The Center also keeps playing a coordinating role in the activity of ICID working group for the countries under socio-economic transformation.

Source: SIC ICWC

3.4. ICSD of Central Asia



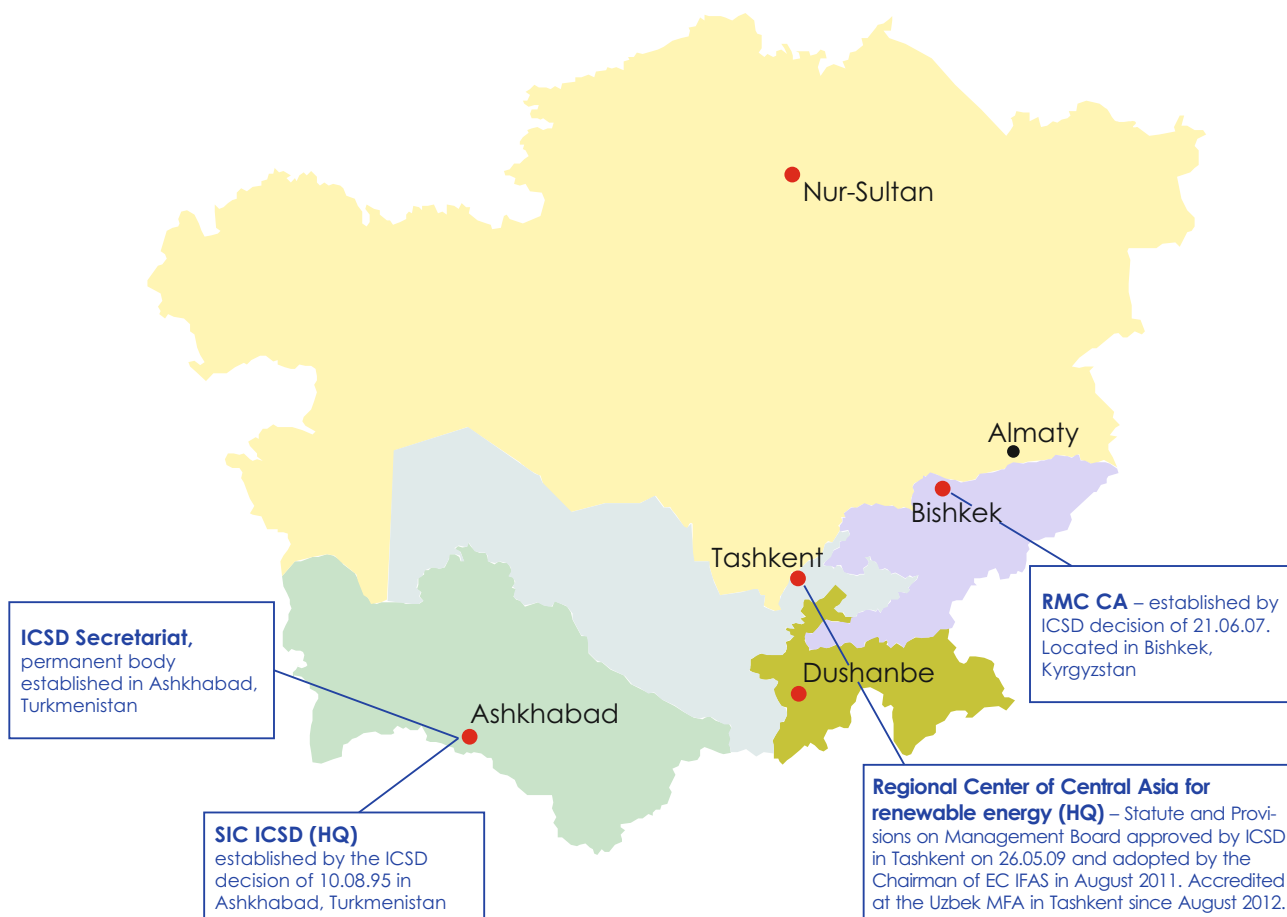
The Interstate Commission on Sustainable Development (ICSD) was established by the decision of the Interstate Council for the Aral Sea Basin in 1993. It is entrusted with the mission of coordination and management of regional cooperation in the field of environmental protection and sustainable development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



3.4.1. ICSD meetings

The 30th meeting of ICSD that brought together the delegations from Kazakhstan, Uzbekistan, Tajikistan and Turkmenistan was held in Nukus on the 24th of October. The meeting reviewed the

progress report of ICSD over the period of Turkmenistan's chairmanship in ICSD (2015-2019) and approved the draft REPSD CA for 2020-2030. It was decided to ensure further institutional and



legal improvement of ICSD and its bodies, particularly, through the adoption of the “Procedure for preparation and holding of ICSD meetings” and the Provision on the Advisory Council of ICSD that would coordinate implementation of REPSD CA. Also, the decision was made to submit the Regional Program to the IFAS Board for consideration and start national procedures for

reaching agreement on the draft REPSD CA in the Central Asian countries.

The focus areas of partnership with UNECE and FAO were determined and a Memorandum of Understanding was signed with UNECE during the meeting. Finally, the chairmanship of ICSD was passed from Turkmenistan to the Republic of Uzbekistan for the period of 2019-2021.

3.4.2. Activity of ICSD in 2019

Development of REPSD CA. The work plan on the program development for 2019 and the schedule of work meetings were approved at the first meeting of RWG in Almaty on December 10-11, 2018. During the 2nd meeting of RWG organized with the support of the GIZ Program for sustainable and climate sensitive land use for economic development in Central Asia and CAREC as part of the [Central Asia Climate Change Conference \(CACCC-2019\)](#), the draft REPSD CA was approved for finalization (April 4, Tashkent). The draft Program was finalized and the Roadmap on the development and negotiation of the final version of the Program was adopted at a technical meeting of RWG. The procedure for preparation and holding of ICSD meetings and the Provision on the ICSD Advisory Council were

determined at this meeting as well (April 22-25, Almaty).

The 3rd meeting of RWG and international partners approved the finalized draft (May). Then, the draft Program was submitted to the CA countries for approval by NWGs and ICSD members (June). The draft REPSD CA finalized on the basis of the feedback received is to be presented at the next meeting of ICSD.

Capacity building and training. In 2019, as part of the Memo signed with CAREC, a series of webinars was organized between water specialists of Turkmenistan and teaching staff of TIAME on: advanced methods of drafting on-farm and system-based water use plans; water saving

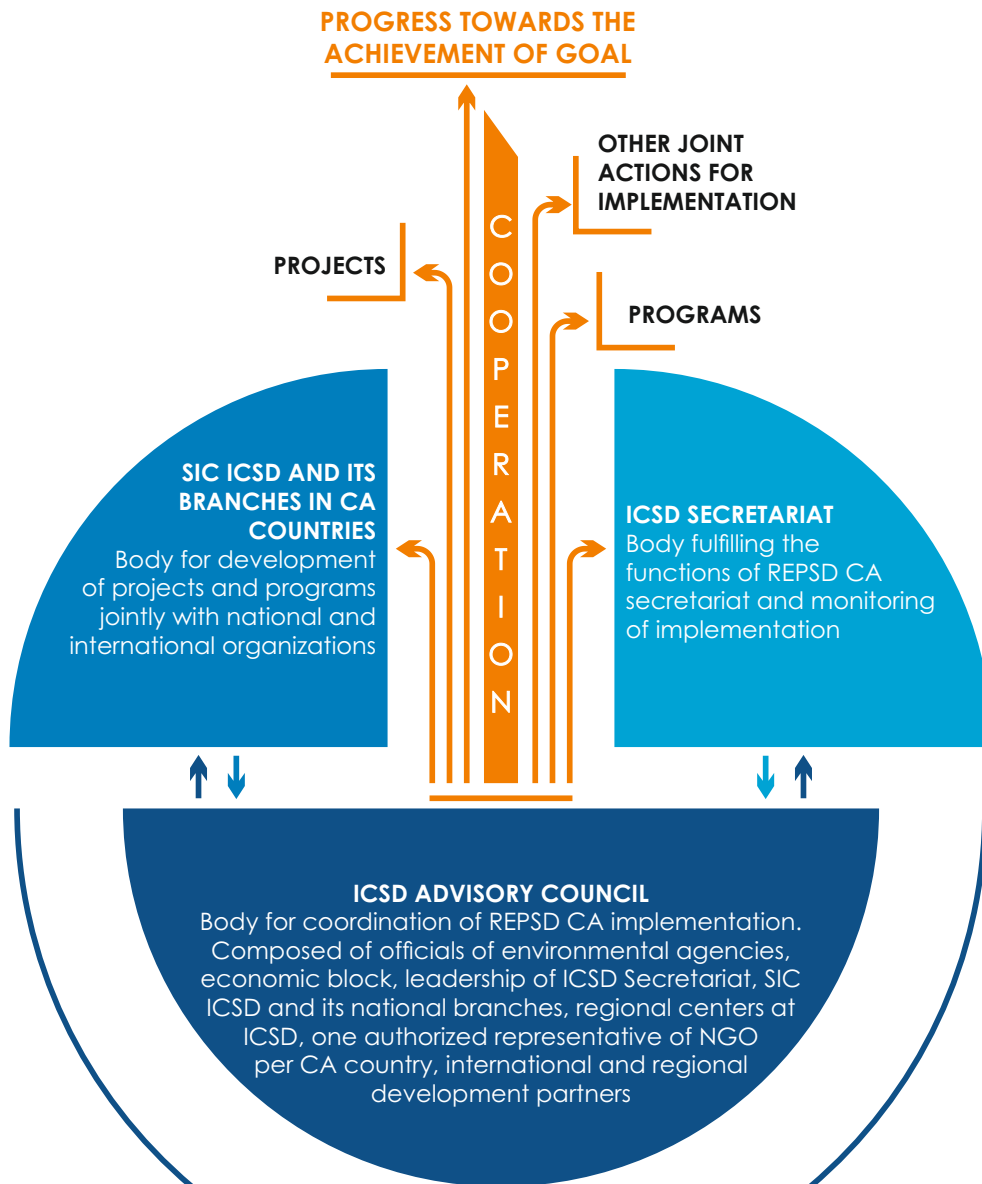
technologies and efficient irrigation water use methods adapted for Uzbek and Turkmen conditions.

Publications. International Journal of Research and Practice “Desert Development Problems”: Babaev A.G. Studying desertification processes in the Aral Sea basin and ways of prevention (Issue

1-2/2019); Babaev A.G. Anthropogenic ecology of Kara Kum (Issue 3-4/2019); Esenov P. Problems of geo-ecology in the irrigated area of Turkmenistan (Issue 3-4/2019); Muradov Ch.O. Information support of sustainable development in the Aral Sea basin (Issue 3-4/2019).

Source: Secretariat and SIC ICSD

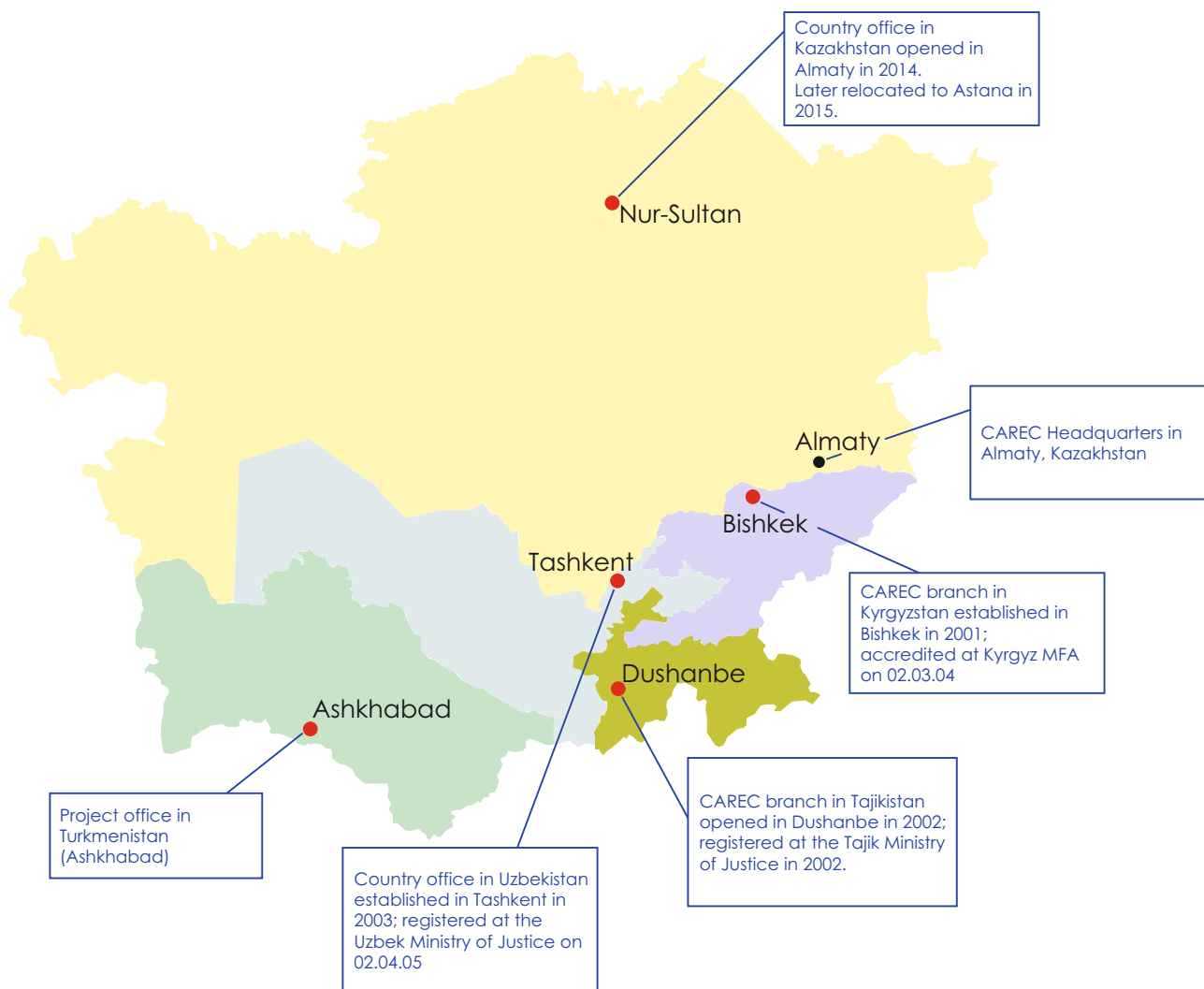
Graphical presentation of REPSD CA implementation



3.5. Regional Environmental Center for Central Asia



CAREC is an independent, non-profit, nonpolitical international organization, which assists the Central Asian governments, regional and international stakeholders and partners in addressing their environmental and sustainable development issues in Central Asia. The headquarters is located in Almaty, with the country offices operational in five Central Asian states.



Activity of CAREC in 2019

For CAREC, the year 2019 turned to be a successful start of new initiatives and a year of ongoing work on the key projects region-wide. It was a year of furthering partnerships and strengthening trust between the countries in order to address common environmental problems.

Water-energy-food security. Phase I of the regional EU-funded project “Central Asia Nexus Dialogue: Fostering Water, Energy and Food Security Nexus Dialogue and Multi-Sector Investment” ([NEXUS](#)) has been completed. The participating countries have endorsed eight project ideas aimed at addressing problems in transboundary water resource management.

A number of events were held: the [3rd Executive Committee Meeting of the Nexus Regional Dialogues Program](#) to review the results of the Program Phase I implementation in five regions of the world (Niger River Basin and Senegal River Basin, Middle East and North Africa (MENA), South Africa (SADC), Latin America and Central Asia) and to discuss proposals for the Phase II of the Glo-

bal Nexus Program (June 5-6, Bonn); [study tour](#) to the Danube and Sava River Commissions (May 13-18); [4th Executive Committee Meeting](#) to review the current results of the project implementation (June 18-19, Dushanbe); [Closing conference](#) and an exhibition to present the results of the project (November 28, Ashgabat).

Activity on water quality. One of the few regional initiatives on the topic is a Regional Working Group on Water Quality (RGW-WQ), which was established in 2009 by UNECE and CAREC. Since 2019 the RWG-WQ is supported by the [Blue Peace Central Asia \(BPCA\) initiative](#) of SDC, where CAREC is acting as a Secretariat of the BPCA Dialogue Platform. The project aims to promote evidence-based dialogue at the political level and to ensure support of effective and sustainable transboundary water management in Central Asia. Water quality is one of the thematic directions of the work of the platform. The spotlight of the regular [meeting of RWG-WQ](#) was the presentation on the transition of Kazakhstan to the Unified System of Classification

of Water Quality in water bodies. The new classification system allows assessing the actual ecological state of the watercourse as well as setting the “targets” to achieve better water quality in a watercourse than its current state. The members of RWG-WQ have visited the new water pumping station constructed instead of the old one in order to provide water to the residents of Beshbulok and the villages in the surrounding area⁸ and were introduced with the results of the “Rural Water Supply and Sanitation” Project⁹ (November 11-12, Tashkent). At the [second meeting](#) the water quality experts of the two countries have reached agreement on sampling points, measurement procedures and regular exchange of results, summarized the results of implementation of the work plan for 2019 and approved a work plan for 2020-2021 (November 7-8, Nur-Sultan).

In 2019, the [Central Asian Leadership Program on Environment for Sustainable Development](#) (CALP) focused on environmental innovation and was designed for advanced mid-level professionals from Central Asian countries and Afghanistan, representing the state, non-governmental, academic and business sectors. The [10th Anniversary CALP](#) was organized together with partners in Almaty (September 16-22). The OSCE-SIWI [Regional training on water diplomacy with a special emphasis on gender-sensitive negotiation and mediation skills](#) (September 23-25) and a training seminar on legal framework of climate change adaptation and mitigation in Central Asia (September 26-28, GKU, Almaty) were organized as a follow-up to the 10th anniversary. From 2010 to 2019, about 280 people graduated from the Leadership Program.

Graduates of the CALP make significant contributions to the promotion of regional cooperation and sustainability in various sectors throughout the region.

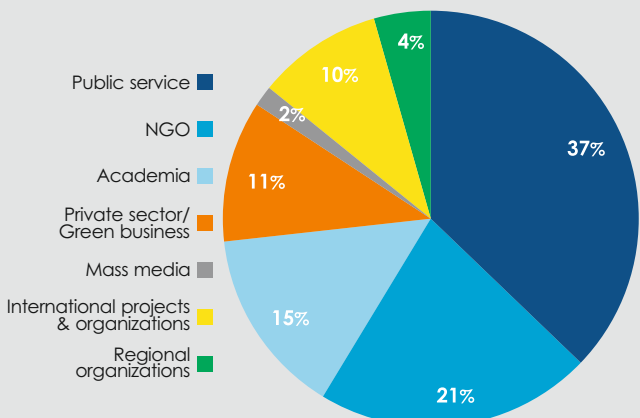
The Network of Academic Societies (NAS) is formed in the CA countries under CAREC’s initiative to provide exchange of academic knowledge, research development, modern methods and technologies in the field of integrated water resources management. The network includes representatives of universities and research institutes working on water management, climate change and cross-sectoral issues. In 2019, within the framework of the [Smart Waters Project](#), two meetings of NAS were organized with the support of USAID (April 2, Tashkent; November 27, Ashgabat). As a result of the meetings and group discussions, practical steps were proposed by members to strengthen the academic capacity in CA and Afghanistan: create an expert working group, which will develop an updated draft curriculum for training engineers in the field of water sector; on the basis of existing interactive map, create an online database of experts specialized in the development of academic potential in the region; finally create an electronic online library containing already existing teaching aids.

Activity on small transboundary rivers in CA. The establishment and support of the Small Basin Councils (SBC) on small transboundary rivers is among priority directions of CAREC. As part of the [Smart Waters](#) project, the following events were organized:

- the [second joint meeting of SBCs](#) of the Uzbek and Kyrgyz parts of the Padshaata River. The participants discussed concrete issues on water resources management of the Padshaata River. In particular, the joint repair of bearing post on the Kyrgyz side of the river, as well as installation of water measurement devices for effective and accurate data. During the demotour, representatives of SBC of the river’s Kyrgyz part learned about water management experience in Uzbekistan and support given by the government to the farmers who apply water-saving technologies (April 22-23, Namangan);

- an extended workshop of SBCs of Central Asia and Afghanistan in partnership with EC IFAS (June 25, Mary, Turkmenistan). 13 members of SBCs established under the project took part in the workshop. The participants discussed the ro-

CALP ALUMNI NETWORK, 2010-2019



⁸ The [Syrdarya Water Supply Project](#) financed by the State Secretariat for Economic Affairs (SECO) of Switzerland

⁹ SDC Project [Rural Water Supply and Sanitation](#)

le of SBC in water management and their influence on territorial development, their legal and institutional status in the countries, networking of the Councils and prospective cooperation with international partners;

- [festive event](#) dedicated to the Aspara River Day. The event aimed at strengthening the interstate cooperation, friendship, good-neighborliness and mutual trust of the riparian parties (July 4-5, Merke village, Southern Kazakhstan);

- the first joint Tajik-Kyrgyz meeting of SBCs of the Isfana River and the Aksu River (September 12, Guliston, Sogd province, Tajikistan). The aim of the meeting was to present the newly established Small Basin Councils in Tajikistan and Kyrgyzstan, discuss their activity and strengthen the interstate cooperation, good-neighborliness and mutual trust;

- the festival “Isfara River – the River of Friendship” as a celebration of the Isfara River Day and a joint Tajik-Kyrgyz meeting of the small basin councils (November 5, Isfara, Tajikistan).

In 2019, **dialogues on climate change between representatives of the MFA and CA parliamentarians** continued as part of the project [CAMP4ASB](#). In particular: the 2nd Central Asia Climate Change Conference (April 3-4, Tashkent) to discuss next steps in developing the dialogue; a meeting to learn about the results of the advanced research, exchange experience and maintain the regional dialogue on climate change adaptation and mitigation (August). A delegation from the Intergovernmental Panel on Climate Change (IPCC) informed the participants on conclusions of the Fifth Assessment Report, the Special Report on Global Warming of 1.5°C, and the Special Report on Climate Change and Land.

Building capacities of national hydrometeorological services. Huge capacity building efforts are made to improve the quality of meteorological, hydrological and agrometeorological forecasts. Different tools and methodologies were adapted and tested for that in the region, with following trainings and adoption of tools in routine practices of hydrometeorological centers in the CA countries. A roundtable among the heads of relevant departments of hydrometeorological centers was held and identified an urgent need in improving the forecast quality. As part of the CAMP4ASB project, a capacity building program was organized for the specialists of the CA country hydromets. Based on the trainings, the KazHydromet specialists were able to adapt a hydrological model for ten-day forecasting with good reliability (up to 86% in some rivers).

Source: CAREC







Section 4

Bilateral Water Cooperation Between the Countries of Central Asia

4.1. Kazakhstan – Kyrgyzstan

High-level meetings

On the 29th of May, the President of Kyrgyzstan Mr. S. Zheenbekov paid a **working visit** to Kazakhstan to participate in the session of the Interstate Council of the Eurasian Economic Community. Within the framework of this visit, the Head of the Kyrgyz Republic met with the President of Kazakhstan Mr. K.-J. Tokayev and the first President of Kazakhstan Mr. N. Nazarbayev.

On the 13th of June, the President of the Republic of Kazakhstan Mr. K.-J. Tokayev paid a **working visit** to Kyrgyzstan to participate in the SCO Summit. As part of this event, the President of Kyrgyzstan Mr. S. Zheenbekov met with Mr. K.-J. Tokayev, who arrived in Bishkek the next day after his inauguration.

At the invitation of the President of Kyrgyzstan Mr. S. Zheenbekov, the President of the Republic of Kazakhstan Mr. K.-J. Tokayev paid the **first state visit** to Kyrgyzstan on the 27th of November. The Presidents held a bilateral meeting in a narrow format and then chaired the fifth meeting of the Supreme Interstate Council of the Republic of Kazakhstan and Kyrgyzstan.

Source: <https://mfa.gov.kg/en/dm/Embassy-of-the-Kyrgyz-Republic-to-the-Republic-of-Kazakhstan/Menu---Foreign/--uslugi/Political-collaboration/political-collaboration>

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, 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. CTWC held 26 meetings in 2006-2019. In 2019, two meetings were held: 25th meeting on

March 14 in Taraz and 26th meeting on December 19 in Bishkek. The agenda of the meetings included the following: interstate water allocation; repair operations at the interstate facilities; report of the Working Group on Environmental Protection; progress on international projects.

Working Groups. In 2019, as part of the activities of the Working Group on Environmental Protection, water samples were taken from the Chu, Talas, Asa, Kechi Kemin and Kuragaty Rivers at preliminary agreed 16 points on 17 hydrochemical indicators. Discussion of the results is planned at the next meeting of the Working Group in April-May 2020.

Projects. Within the framework of the "[Enabling Transboundary Cooperation and Integrated Water Resources Management in the Chu and Talas River Basins](#)" project (GEF/UNDP/ UNECE), stakeholders from Kyrgyzstan and Kazakhstan approved the Strategic Action Program, which was developed and approved by the Commission. Implementation of the UNECE project "Enhancing Climate Resilience and Adaptive Capacity in the Transboundary Chu-Talas Basins" funded by the Government of Finland and the SDC project "Water Accountability in the Transboundary Chu-Talas River Basins" in part of the SCADA systems is continued. The work is under way to establish Small Basin Councils in the Chu-Talas basin under the CAREC projects.

Source: Head of the Kazakh Party of the CTWC Secretariat

Other water-related arrangements

In 2019, the electricity exchange between Kyrgyzstan and Kazakhstan reached 270 million kWh. This exchange took place in the framework of the 8th Kyrgyz-Kazakh Intergovernmental Council to provide agricultural consumers of Kazakhstan with irrigation water.

Source: <https://24.kg/english/124047-Electric-Station-company-admits-exchange-of-electricity-with-Kazakhstan/>

4.2. Kazakhstan – Turkmenistan

High-level meetings

On October 11, the President of Kazakhstan Mr. K.-J. Tokayev and the President of Turkmenistan Mr. G. Berdimukhamedov met in Ashgabat on the margins of the Session of the Council of the

CIS Heads of State. The Heads of State discussed a wide range of issues on the bilateral agenda, the regional situation, as well as cooperation under various international formats.

Source: www.akorda.kz

4.3. Kazakhstan – Tajikistan

High-level meetings

On June 14, the President of Tajikistan Mr. E. Rahmon received the President of Kazakhstan Mr. K.-J. Tokayev, who arrived in Dushanbe to participate in the fifth Summit of the Conference on Interaction and Confidence Building Measures in Asia.

The Parties discussed the development and expansion of cooperation in trade and econo-

my, water and energy, transport and communications and other mutually beneficial spheres.

The President of Tajikistan Mr. E. Rahmon received the Prime Minister of Kazakhstan Mr. A. Mamin, who arrived in Tajikistan with an official visit. Among others, the issues related to the development and expansion of water, fuel and energy cooperation were discussed.

Source: www.president.tj

4.4. Kazakhstan – Uzbekistan

High-Level Meetings

On April 14-15, the President of Kazakhstan Mr. K.-J. Tokayev paid a **state visit** to Uzbekistan. During the meeting, the Parties discussed prospects for strengthening of bilateral friendship and good neighborhood, cooperation in trade, transport, industry, tourism, and other spheres and exchanged views on regional and international issues of mutual interest.

Source: www.akorda.kz

Meetings of the Working Group on Water Management

In November 2016, a joint Kazakh-Uzbek Working Group was set up to develop proposals for enhanced bilateral water cooperation. The Uzbek side of the Working Group is led by Mr. Sh. Khamraev, Minister of Water Management of Uzbekistan, while the Kazakh side was first led by Mr. Ye. Nyssanbayev, Vice Minister of Agriculture, and now is headed by Mr. S.N. Gromov, Vice-Minister of Ecology, Geology and Natural Resources. The Working Group meets to discuss the challenging issues related to water use in the mid-

dle and lower reaches of the Syr Darya River and in other transboundary basins in the territories of the both countries and find the ways for further improvement of bilateral cooperation.

As of 1 January 2020, 7 meetings of the Working Group were held. At the 6th meeting, the Parties discussed fulfillment of the decisions made at the previous meetings, considered water discharge from the Shardara reservoir into the Aydar-Amasai lake system, and discussed a draft bilateral agreement on joint management, use and protection of transboundary water resources (February 26, Tashkent).

The 7th meeting of the Working Group was held in Almaty on November 5, 2019, with the participation of the Minister of Water Management of Uzbekistan Mr. Sh.R. Khamraev and the Vice-Minister of Ecology, Geology and Natural Resources of Kazakhstan Mr. S.N. Gromov. It discussed implementation of the decision of the 6th meeting and a draft bilateral agreement on joint management, use and protection of transboundary water resources.

Source: Ministry of Water Management of the Republic of Uzbekistan

4.5. Kyrgyzstan – Tajikistan

High-Level Meetings

On July 26-27, for the first time in the history of Kyrgyz-Tajik relations, the Presidents of Kyrgyzstan and Tajikistan **met** on the Kyrgyz-Tajik state border with local residents and elders of border villages of the two countries. Also, working visits of the Kyrgyz President Mr. S. Zheenbekov to Tajikistan (26.07.2019, Isfara) and the Tajik President Mr. E. Rahmon to Kyrgyzstan (27.07.2019, Cholpon-Ata) took place.

The leaders of two countries had negotiations in narrow and extended formats.

On October 11, the Kyrgyz President Mr. S. Zheenbekov **met** with the President of Tajikistan Mr. E. Rahmon within the framework of the regular meeting of the CIS Council of Heads of State in Ashgabat. The water and energy cooperation matters were addressed between the two countries at the meeting. The Parties stressed the im-

portance of accelerated delimitation and demarcation of the Kyrgyz-Tajik state border. It was noted that for Tajikistan and Kyrgyzstan the development of hydropower is of great importance, but with account of the interests of other states in the region. The confidence was expressed that hydropower projects in Tajikistan and Kyrgyzstan will give a positive impetus to achieving SDGs by 2030 and addressing socio-economic challenges in the countries of Central Asia and beyond.

On November 27, the President of Tajikistan Mr. E. Rahmon and the President of Kyrgyzstan Mr. S. Zheenbekov met face-to-face on the sidelines of the session of the CSTO Collective Security Council in Bishkek. As a result of the meeting, an agreement was reached to intensify the negotiation process between the Government delegations of Kyrgyzstan and Tajikistan on the delimitation and demarcation of the Kyrgyz-Tajik state border.

Source: <https://mfa.gov.kg>, www.president.tj/

4.6. Kyrgyzstan – Turkmenistan

High-level meetings

On October 11, the President of Kyrgyzstan Mr. S. Zheenbekov and the President of Turkmenistan Mr. G. Berdymukhamedov met in Ashgabat on the margins of the Session of the Council of the

CIS Heads of State. The topical issues and priority areas of bilateral cooperation between Kyrgyzstan and Turkmenistan were addressed.

Source: <http://president.kg>

4.7. Kyrgyzstan – Uzbekistan

High-Level Meetings

On November 29, a meeting between the President of Uzbekistan Mr. Sh. Mirziyoyev and the President of Kazakhstan S. Zheenbekov was held within the framework of the second Consultative Meeting of the Heads of State of Central Asia. This format of meetings has already proved to be an effective platform for discussing pressing regional issues. Following the meeting, the Parties agreed to hold the third Consultative Meeting in Kyrgyzstan in 2020.

President of Uzbekistan is the “Person of 2019” in Kyrgyzstan. On February 17, 2020, a solemn event was held in the conference hall of the Embassy of Uzbekistan in Kyrgyzstan on the occasion of awarding the title “Person of 2019” to President Shavkat Mirziyoyev by Ala-Too Aiymdary (Ala-Too Women) Ecological Movement. On behalf of the country’s leadership, the First Deputy Minister of

Foreign Affairs Ilkhom Ne’matov arrived in Bishkek to receive the special award and diploma.

Source: <https://uza.uz/>, <https://mfa.uz/en/>

Meetings of the Working Group on Water Management

The Group worked within the framework of the Interagency Agreement on the establishment of a joint bilateral water commission to find constructive solutions for water and energy issues. On August 27, 2019, a meeting was held in Namanagan to approve the Regulations on the Permanent Commission for the Intergovernmental Use of the Orto-Tokay (Kasansay) reservoir and its composition, including the first meeting of the Commission.

Source: Ministry of Water Management of the Republic of Uzbekistan

4.8. Tajikistan – Turkmenistan

High-level meetings

On October 11, the President of Tajikistan Mr. E. Rahmon and the President of Turkmenistan Mr. G. Berdymukhamedov met in Ashgabat on the

margins of the Session of the Council of the CIS Heads of State. Cooperation in the transport and communication sector was a separate topic of discussion.

Source: <http://avesta.tj>

4.9. Tajikistan – Uzbekistan

High-level meetings

On April 25, on the sidelines of the second Belt and Road Forum for International Cooperation, the President E. Rahmon **held talks** with the President Sh. Mirziyoyev. The Heads of State expressed their satisfaction with the current state of cooperation. The Parties called important political events of 2018 historical as a result of mutual efforts, which have laid a solid foundation for effective cooperation in all spheres. The importance of implementation of reached agreements and of the Intergovernmental Commission on Trade and Economic Cooperation was also highlighted.

On June 14, on the sidelines of the Summit of Conference on Interaction and Confidence-Building Measures in Asia, the Presidents of Tajikistan and Uzbekistan **held a meeting**. They discussed the development of trade and economic relations, the establishment of joint production enterprises, an increase in volume of trade turnover, as well as other spheres of mutually beneficial cooperation.

On October 11, on the sidelines of the Council of CIS Heads of State in Ashgabat, the President of the Republic of Tajikistan Mr. E. Rahmon **held a meeting** with the President of the Republic of Uzbekistan Mr. Sh. Mirziyoyev. The discussion focused on the development of strategic partnership and prospects for mutually beneficial cooperation of the countries.

Source: www.president.tj

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

As part of the state visit of the President of Uzbekistan Mr. Sh. Mirziyoyev to the Republic of Tajikistan, an Uzbek-Tajik Working Group on integrated transboundary water use in Central Asia was established (March 9-10, 2018).

As of 1 January 2020, two meetings of the Working Group were held – on June 6, 2018 in Tashkent and on November 28, 2018 in Dushanbe. No meetings took place in 2019.

Other water-related arrangements

In 2018, Uzbekistan and Tajikistan resumed energy supplies between the countries. In 2019, 1.4 bil-

lion kWh of electricity was exported from Tajikistan to Uzbekistan at a price of 2 cents/kWh. The total electricity export from Tajikistan to Uzbekistan amounted to US \$28.5 million.

Cooperation on the Zeravshan River

The Zeravshan (Zarafshan) River is a former tributary of the Amu Darya River. It rises in the Zeravshan glacier (2,800-5,500 m), flows in latitudinal direction from east to west between the Turkistan ridge (4,500 m) in the north and Zeravshan ridge (5,500 m) in the south; in the west, it enters a vast plain and is used for irrigation there.

The run-off formation area of the river is almost entirely located within the territory of Tajikistan, and the river's lower reaches are in Uzbekistan. The river is of great importance for the both countries. Tajikistan is interested in developing hydropower resources in the Zeravshan basin, the potential of which is more than 20 billion kWh (Master Plan for Integrated Use of the Zeravshan River). The river water is used for irrigation of 554,930 ha of fertile irrigated land in Samarkand, Bukhara, and Navoi provinces and partially in Kashkadarya and Djizak provinces. It is also the source of life for 6,040.5 thousand people in these regions. The Zeravshan River also used to feed the land of Bukhara province earlier. To increase water supply, Uzbekistan had to transfer water through the Amu-Bukhara Canal and practically cut off Bukhara from the Zeravshan.

In August 2018, within the framework of the state visit of the President of Tajikistan to Uzbekistan, the Parties have [agreed](#) to consider joint construction of two hydropower plants, with the total capacity of 320 megawatt in the Tajik area of the Zeravshan River. **In 2019 and early 2020**, the authorized agencies of the Parties worked on the matter:

- On January 28, 2019, the Deputy Minister of Energy and Water Resources of the Republic of Tajikistan Mr. D. Shoimzoda announced at a [press conference](#) the establishment of a joint Working Group, which would delineate the construction site and set methods HPPs will be built. After technical discussions, financial matters would be addressed, and then the design work would start;

- On April 3, 2019, the Termez city hosted a [meeting](#) of the Intergovernmental Commission on Trade and Economic Cooperation of Uzbekis-

tan and Tajikistan under the chairmanship of Prime Ministers. The Commission has decided to activate joint hydropower projects:

- On January 28, negotiations were held in Tashkent between the Working Groups of Uzbekistan and Tajikistan to discuss the joint construction of HPPs on the Zeravshan River. The Tajik delegation was led by Mr. J.Sh. Shoimzoda, Deputy Minister of Energy and Water Resources, while the Uzbek delegation – by Mr. J. Mirzamakhmudov, First Deputy Minister of Energy of Uzbekistan. The focus of discussion was on a draft agreement between the Governments of Uzbekistan and Tajikistan on the procedure and terms for sharing of construction and operation of hydropower plants on the Zeravshan River. After reaching a general agreement, more details will be spelled out in the agreement on the purchase of electricity and the development of a feasibility study for the project.

According to the [Uzbek Ministry of Energy](#), the construction of hydroelectric power plants is planned to be carried out in stages: first, the construction of the Yavan HPP with an estimated cost of US \$282 million, capacity 140 MW and generation of 700-800 million kWh of electricity. At the next stage, the Parties will consider the possibility of building a HPP on the Fan Darya River with an estimated cost of US \$270 million, capacity 135 MW and generation of 500-600 million kWh. The constructed HPPs will generate up to 1,400 million kWh of ecologically clean electricity exclusively for the needs of the Republic of Uzbekistan. The project will help maintain the peak capacity of the unified energy system, create new jobs and contribute to transfer of electricity to other regions of Uzbekistan and Tajikistan on a parity basis.

This project of joint water development of the transboundary Zeravshan River is of political, economic and social significance. While establishing organizational and legal framework for cooperation, it is important to take into account modern and prospective hydrological and climatic conditions in the basin.

The design flow of the Zeravshan River is 5.14 km³ (Dupuli GS¹⁰, 1950-2010). In 2000-2008, the average annual flow decreased by 0.14 km³ and amounted to 5 km³ in the multi-year period. In 1979-1996, the average annual discharge de-

creased to 120-117 m³/s. In 2005-2020, water discharge was well higher than the norm – 200-250 m³/s. The data on the Ravatkhodja GS in Uzbekistan is slightly different: it shows the average flow of the Zeravshan River at 4.6 km³ for 2005-2009. According to WUEMoCA-based estimations, precipitation in the river's run-off formation zone was the lowest in 2005-2009. Within the Dupuli GS/Ravatkhodja GS reach, there is minor water intake on the left bank to the Urgut district ($Q_{max} = 3 \text{ m}^3/\text{s}$). There is also the Magiandarya tributary.

The Zeravshan River and its tributaries have glacial-snow feeding. There are 1,272 glaciers in the basin, with the total area of 708.5 km² and the volume of 36.8 km³.¹¹ It is estimated¹² that the volume of glaciers in the basin would decrease significantly in the next 50 years. The Zeravshan glacier will degrade on an area of 25-30 km², and this will lead to its 30-35% shrinkage and, consequently, to a twofold decrease in glacier runoff. Currently, the glacier runoff of the Zeravshan River is estimated at 1.3 km³ (25% of the total run-off), whereas, by 2050, it is expected to decrease to 0.629 km³, and the total run-off will decrease by more than 10-12%. Therefore, the Zeravshan River and its tributaries can switch from glacial-snow to snow-glacial feeding.

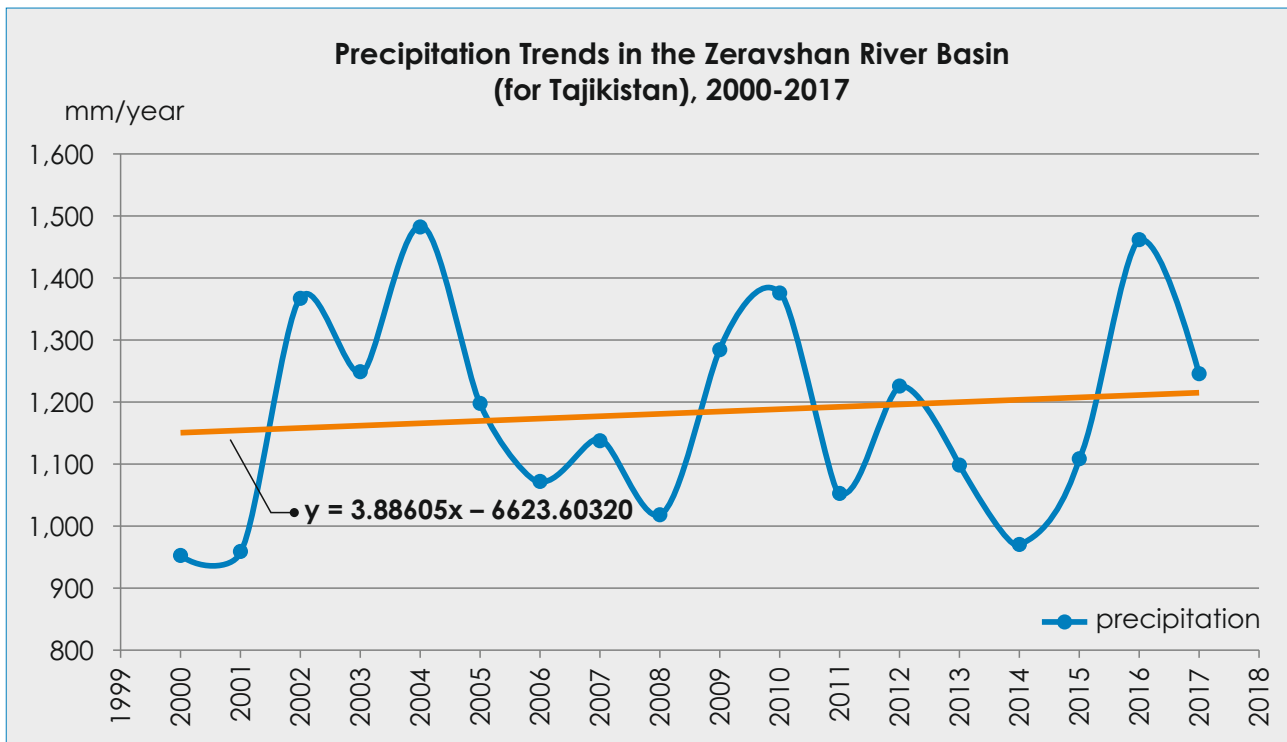
RS-based measurements by SIC ICWC show that over the last 20 years precipitation over the catchment area of the Zeravshan River in Tajikistan has increased (this can be seen in the graph below). At the same time, high fluctuations of precipitation and 170-200 mm decrease in the dry years 2000, 2008, and 2014 are observed. This fact requires greater control over water availability in the river from the side of the both countries.

To ensure sustainable water management in the Zeravshan River basin in the context of climate change, it is important to organize regular measurements and exchange data on daily river discharge between the hydrometeorological services of the countries. An agreement on joint development of hydropower resources of the Zeravshan River should also provide for mutual obligations of the parties to guarantee water releases through the Dupuli GS and Pervomayskaya dam that would not cause an increase in water shortage in summer against the natural river flow.

¹⁰ Gauging station

¹¹ Catalogue of glaciers of USSR. Book 14, Issue 3, volumes 1, 2. Zeravshan River Basin – L.: Hydrometeoizdat, 1982

¹² Abrorov Kh., Akhmadov A.Sh. What changes await the glaciers of mountain Zeravshan. http://www.cawaterinfo.net/zeravshan/pdf/abrorov-ahmadov_ru.pdf



Source: SIC ICWC, 2020

4.10. Turkmenistan – Uzbekistan

On November 28, the President of Turkmenistan Mr. G. Berdymukhamedov arrived to Uzbekistan with a working visit to discuss prospects for the Turkmen-Uzbek cooperation and participate in the second Consultative Meeting of the Heads of State of Central Asia. During the talks, a wide range of issues concerning current state and prospects for the Turkmen-Uzbek partnership was discussed.

Source: <https://mfa.uz/en/press/news/2019/11/22147/?print=Y>

On August 16, the Turkmen-Uzbek political consultations took place. The delegations headed by the Minister of Foreign Affairs of Turkmenistan Mr. R. Meredov and Minister of Foreign Affairs the Republic of Uzbekistan Mr. A. Kamilov addressed the issues of bilateral cooperation in political, trade-economic and cultural-humanitarian spheres. During the talks, the Parties stated the need for widening water and land cooperation. Following the consultations, the Parties signed the Program of cooperation for 2020-2021 between the Ministry of Foreign Affairs of Turkmenistan and the Ministry of Foreign Affairs of the Republic of Uzbekistan.

Source: <https://www.mfa.gov.tm/en/news/1561>

Working Groups and Commissions

On November 23, the 15th session of the Joint Turkmen-Uzbek Commission on Trade-Economic,

Scientific-Technical and Cultural Cooperation was held in Ashgabat. Among other matters, the Parties discussed in detail the interaction in the field of agriculture, water resources and environmental protection. The next meeting of the Commission is to be held in Tashkent in 2020.

Source: <https://www.mfa.gov.tm/en/news/1755>

In 2019, the parties worked on an agreement between the Government of the Republic of Uzbekistan and the Government of Turkmenistan on the joint Turkmen-Uzbek Intergovernmental Commission on Water Issues. A draft agreement has been discussed with relevant ministries and departments of the countries and is ready for signature.

Source: Ministry of Water Management of the Republic of Uzbekistan

Water cooperation between Uzbekistan and Turkmenistan is maintained through the Trilateral Working Group, which also includes BWO Amu Darya. The Parties constructively, in the spirit of mutual trust and respect for each other's interests, address the issues related to water sharing in the Amu Darya basin. By 1 January 2020, the Group held 204 meetings, including 12 meetings of water management organizations responsible for the river's lower reaches on the issues of water allocation in 2019.

Source: BWO Amu Darya

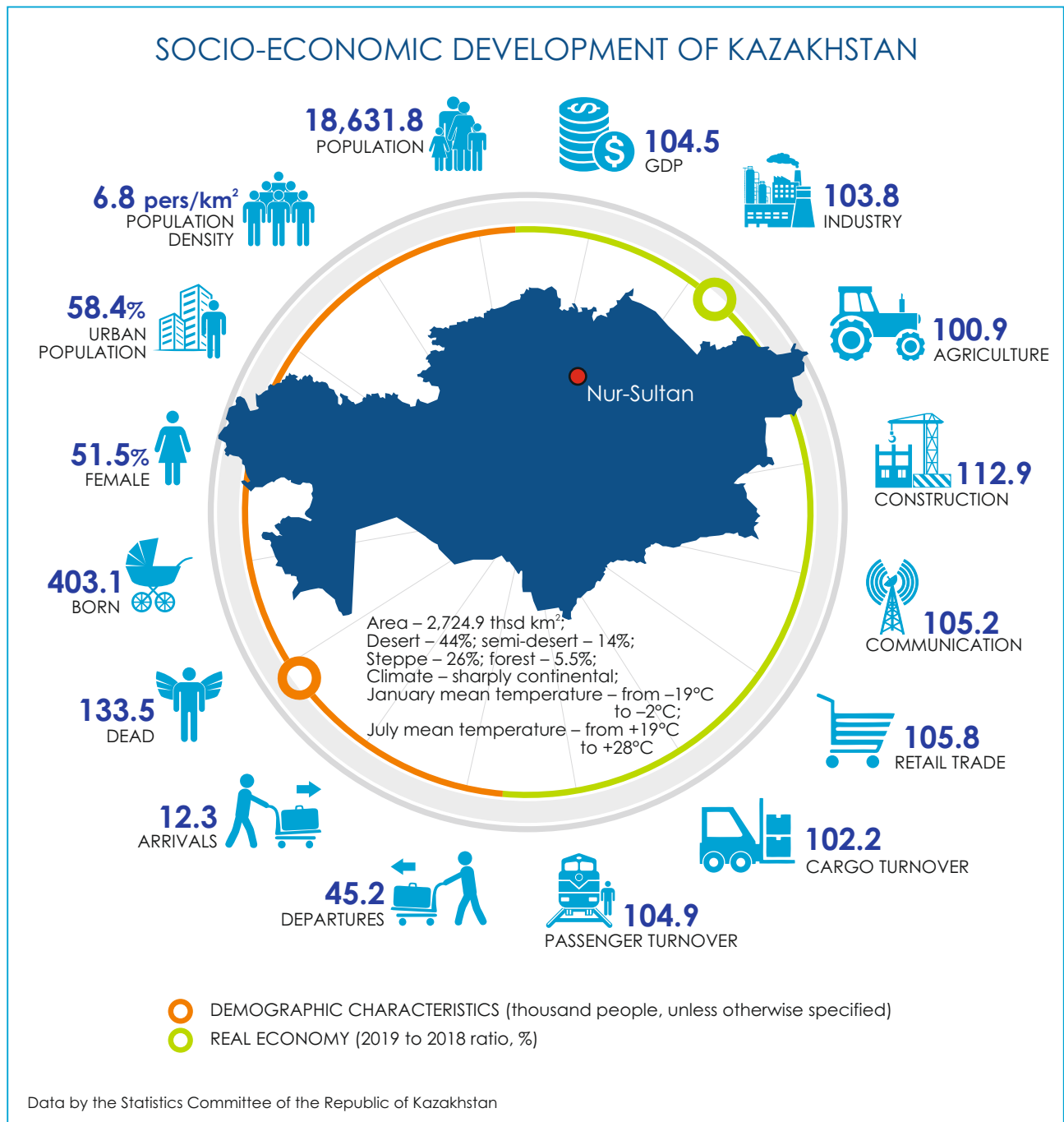




Section 5

Key Water Developments in the Countries of Central Asia

5.1. Kazakhstan



Water Sector

Water resources. The country's annual surface runoff is a little over 100 km³, of which more than 46 km³ are formed outside the national boundaries. The explored groundwater stock is 15 km³/year. The country has 8,500 rivers, 48,000 large and small lakes, with the largest ones of Balkhash, Zaisan and Alakol. The north-eastern area of the Caspian Sea is within the boundaries of Kazakhstan. The Aral Sea is shared by Kazakhstan and Uzbekistan.

Public administration reforms. The [Ministry of Ecology, Geology and Natural Resources \(MEGNR\)](#) was formed and took functions and mandate for: development and implementation of the public environmental policy, waste management, and protection, monitoring and control of natural resource use from the **Ministry of Energy**; use and protection of the water fund, water supply and diversion, and forestry from the **Ministry of Agriculture**; and, geological studies and re-production of the mineral resources base from the **Ministry of Industry and Infrastructural Development** (Decree No. 17 of the President of Kazakhstan,

17.06.2019). MEGNR contains in its structure among others the Department of Transboundary Rivers and the Committee for Water Resources.

Development and implementation of State programs. In the course of 2019, the **Concept of the Kazakhstan's State water management program for 2020-2030**¹³ was developed. The aim is to ensure water supply, preserve and restore water bodies to achieve their good status. The Program will include 10 main directions: international cooperation; improvement of legal framework; institutional reforms; modernization and reconstruction of water infrastructure; learning international best practices on water market; digitization of the water sector; Smart Water project; environmentally optimal water use; training of water professionals; and, national water projects. The Program provides for maintenance of the water balance at the level of 100 km³ by 2030 by increasing surface water by 5-7 km³ through the construction of new reservoirs, saving up to 5 km³ of water, and using up to 15 km³ of groundwater. It is planned to reduce water consumption per unit GDP from 91.2 to 73 m³ per \$1,000; build 26 new hydraulic structures and reconstruct 182 republican structures and 300 public utilities, construct new irrigation systems for irrigation expansion from 1.7 to 3 Mha; increase the length of coated main and distributing canals from 3,400 to 19,000 km. Basin inspections are to be 100% equipped. Additionally, catchment areas will be afforested on 200,000 ha.

Rehabilitation of irrigated land infrastructure was continued as part of the State Program for Agriculture Development for 2017-2021 and the Irrigation Development Plan until 2028. In particular, measures are to be taken in the Zhambyl province to achieve the following 3 targets: (1) rehabilitate irrigation on non-used but needed land area of 86,200 ha through reconstruction of 436 water-management facilities. 31 projects were developed under the EBRD loan and 24 projects among them have got positive governmental expert review. Modernization of three canals covering 1,400 ha in Zhambyl district was started; (2) by the end of 2020, construct three new reservoirs to improve available water supply of land; (3) rehabilitate deteriorated reservoirs Karakonyz, Tasotkel and Yntaly to increase their accumulation capacity 2-3 times.

Under the Irrigation and Drainage Modernization Project¹⁴, Phase 2, 223 canals, 208 wasteways and 149 vertical drainage wells will be re-

habilitated in Almaty, Zhambyl, Turkestan (former South Kazakhstan) and Kyzylorda provinces on an area of more than 39,000 ha. In the first turn, 147 km of canals, more than 191 km of wasteways and 49 vertical drainage wells are to be repaired in rural settlements of Maktaaral district, Turkestan province.

[ADB](#) has approved a \$249.8 million equivalent loan in local currency (tenge) to the Republican State Enterprise Kazvodkhoz (KVK) for the [Irrigation Rehabilitation Project](#) to help in the rehabilitation and improvement of irrigation networks serving 171,000 ha of land in East Kazakhstan, Karaganda, Kyzylorda and Zhambyl provinces. The project will rehabilitate about 245 irrigation schemes. The total length of new concrete-lined canals will be about 1,064 km, while 1,976 km of earth canals will be improved. Other infrastructure works include the construction and rehabilitation of about 4,185 hydraulic structures, including water measuring devices; improvement of 358 km of drainage collectors; establishment of a drip irrigation system covering 9,300 ha in Zhambyl; and the installation of 24 supervisory control and data acquisition systems.

Modernization of hydraulic structures. In 2019, modernization of a waterworks facility on the Bol'shaya Bulon River together with the Aktogan main canal in Koktepa district and Uydenin head intake structure in East Kazakhstan province was completed. The Aitek waterworks facility in Kyzylorda province and the Aspara waterworks facility with feeding channel in Zhambyl province were reconstructed. Operations at Taushaga reservoir in Turkestan province were completed. Reconstruction of Samarkand reservoir in Karaganda province is underway.

International cooperation. Kazakhstan and China have finished the reconstruction of joint intake structure along the Sumbe River in Almaty province. The Chinese water intake sill and spillway threshold were raised by 30 cm, water divider was rehabilitated, and the Kazakh intake was extended to the size of Chinese one. The structure will be operated jointly to share water of the Sumbe River equally 50/50.

A Memorandum of Cooperation was signed between the Kazakh Ministry of Agriculture and the Hungarian Ministry of Interior. The Memorandum provides for quantitative and qualitative monitoring of water, development of basin ma-

¹³ The Program concept was approved by the Government on 28.01.2020

¹⁴ 70% is financed from the Republican budget, while the rest is provided by WB

management plans, legal and economic regulation and incentives. Particular attention is paid to water research (April 29).

An agreement was reached on the development and adoption of the Program for Environmental Improvement of the Zhaiyk (Ural) River Basin during the XVI Forum of the Kazakh-Russian Inter-regional Cooperation (November 6-7, Omsk). An OSCE-supported [technical meeting on rational use and protection of water resources of the Zhaiyk River](#) took place (November 7, Uralsk, Western Kazakhstan) to discuss, among other issues, the national action plans and joint activities on the rational use of river water.

Events. (1) The Second Central Asian Expert Forum “Dialogue on Water Issues in Central Asia: From the National to the Regional Levels” (September 5-6, Nur-Sultan). The Forum was co-organized by the Kazakh Institute for Strategic Studies under the President of the Republic of Kazakhstan, UNRCCA, and the Friedrich-Ebert-Stiftung in Central Asia; (2) the Workshop “Towards Regional Irrigation Modernization Initiatives in XXI”, which brought together more than 80 experts from the five CA countries (November 19-20, Almaty). The Workshop was co-organized by the [CAWEP Program](#) and the Global Water Security & Sanitation Partnership.

Drinking Water Supply

In 2019, as part of the 2020 State Program for development of Kazakh regions, 205.4 km of networks were constructed and 21 rural settlements were provided with drinking water, while 18 rural settlements got improved water supply.

Group water supply systems were constructed in Almaty, Kyzylorda, and Zhambyl provinces. The projects included reconstruction of wells and construction of water mains to connect villages to water supply.

Agriculture

In 2019, the gross agricultural output amounted to 5,216,454.5 million tenge, including crop production – 2,896,965 million tenge, and livestock production – 2,306,414.9 million tenge. The agricultural export amounted to 12.41 million tones for \$3.29 billion, that is \$198 million or 6.4% more than in 2018.

Latest developments in legislation. The Law on amending and adding some legislative acts of the Republic of Kazakhstan on agro-industry

regulation (Law of RK No.268-VI of 28.10.2019) was adopted. The law simplified withdrawal from credit societies, introduced voluntary insurance of agroindustry entities with a package of support measures, and made a provision for the usage of the certificate of insurance as an additional guarantee for loans.

The Order of the Minister of Agriculture of Kazakhstan (No.252 of 03.07.2019) on the approval of the Rules for organization of monitoring over the use of agricultural land allocated for peasants or farmers was put in action. The Rules describe obligations of land users regarding the use of land and measures to be taken by relevant agencies for agricultural land monitoring.

State Programs. As part of the State Program for Agriculture Development in the Republic of Kazakhstan for 2017-2021, the 2018-2027 National Program for beef farming is implemented. The National program is focused on the establishment of relevant farms. In 2019, the program financed purchasing of 82,100 heads of cattle mother-stock and 374,400 of ewes. As a result, 840 new cattle farms and 1,057 new sheep farms were formed. This is by 38% and 2.2 times more, respectively, than in 2018.

The Ministry of Agriculture developed the sectoral program “E-APK”. The aim of the program is to increase labor efficiency and export of processed agricultural products 2.5 times by 2022. The program tasks include the automation of public services, implementation of digital agriculture projects, and development of cooperation between IT-business and agroindustry entities. The program encompasses 224 investment sub-programs for agricultural development.

The State Program “Digital Kazakhstan” is ongoing. At the year-end, 16 additional digital farms and 6 smart-farms were formed in the republic. The agrometeo-service was developed for 5 country’s regions to provide the forecast on more than 10 meteorological parameters 3 days in advance. In the course of field e-mapping, 26 Mha of cropland (100% of the area) and 56.5 Mha of pastures (78.5% of the area) were digitized. The Egistic online service was put into operation. By connecting the online platform, farmers get access to the maps of soil moisture, nitrogen content, snow cover and other parameters of their fields. The [digital platform QOLDAU](#) is also operational. The platform with over 180 users offers the following services: livestock tracking; online loaning; transport logistics; NB-IoT data transmission; weather service; farmer’s accounting and tax service, etc.

Agricultural machinery. In 2019, the average rate of agricultural machinery renewal reached 4% (3.5 % in 2018) in the Republic. Good rates of machinery renewal were shown in Karaganda (4.6%), Akmola (4.5%), Zhambyl (4.4%), Eastern Kazakhstan and Aktyubinsk (4.3%) provinces.

AO "KazAgroFinans" leased 5,893 machines. This is by 72% more than in 2018. The number of high-productive sowing units that perform several operations (cultivation, sowing, fertilization, harrowing, smoothing and packing) also increased – 143 units against 72 ones in 2018.

The first plant for production of 'energy-saturated' tractors "Kirovets" was opened in Kostanay province. It is planned to manufacture up to 700 tractors a year (October).

Projects. As part of ToR signed by ADB and the Ministry of Agriculture (January) on the assessment of resource base for meat production, the monitoring of natural resources in Akmola province (as a pilot region) was undertaken¹⁵. The Memorandum of Cooperation was also signed between KazNAU and the Scientific-Production Center of grain farming named after A. Baraev.

First fully automated soil and agrochemical laboratory was launched with the support of the Ministry of Agriculture in Petropavlovsk. The project totaling 600 million tenge was implemented by the Kazakh company TOO "Agro Lab".

Events. The following international fairs were held: agricultural and food industry fair – Kaz-Agro-2019; livestock production and meat and dairy industry fair – KazFarm-2019 (October, Nur-Sultan).

Capacity building. The Kazakh Ministry of Education and Science has passed to the Ministry of Agriculture the authority to form the order for training in the sphere of agriculture.

The training "Water quality management: EU experience"¹⁶ was held in Nur-Sultan (June 10-12). The International scientific-practical workshop "My first pivot: introduction to mechanized irrigated agriculture"¹⁷ brought together representatives of farm business from Kazakhstan, US, Russia and Uzbekistan (October 15-16).

Regional and international cooperation. The Ministry of Agriculture signed (1) a Roadmap with

the Ministry of Agriculture of Uzbekistan on cooperation in the area of agricultural sciences, production, certification, trade, digitization, veterinary and livestock breeding, and plant quarantine for 2019-2024 (November 17); (2) a Memorandum of Cooperation with the Argentine's National Institute of Agricultural Technology; (3) agreements with "Tyson Foods" on implementation of agro-multiprotein industry development program in Kazakhstan and construction of an up-to-date meat processing factory in Kazakhstan, as well as with "Kusto Group" and Valmont Industries on promotion of efficient irrigation and productive agriculture principles in Kazakhstan. A plant will be constructed in 2022 to manufacture 1,000 broadside and center pivot irrigation units a year; (4) an Agricultural cooperation agreement with Estonia; (5) the joint declaration of intent with the German Ministry of food and agriculture and the joint statement for taking the German Agrarian Center under patronage of the Association for the Sustainable Development of Modern Agricultural Methods and Technologies in Kazakhstan (December 5-6, Germany).

Energy

Latest developments in legislation. A draft law was adopted for ratification of the Agreement between the Government of Kazakhstan and the European Organization for Nuclear Research (CERN) on international cooperation¹⁸ (September 26). A roadmap was developed and approved by the joint order of the Ministry of Economy and the Ministry of Education and Science of Kazakhstan. The roadmap provides for cooperation of institutes and research organizations with CERN laboratories in the area of fundamental and applied research, nuclear medicine, nuclear physics, etc.

Hydropower. The Shardara HPP commissioned in 1967 is reconstructed and modernized by the Austrian-German company Andritz Hydro GmbH at the total cost of 38 billion tenge. First, second, and third aggregates were put into operation in February, April, and December, respectively. The fourth aggregate is planned to be launched in February 2020. The plant's capacity is to increase from 100 to 126 MW/year after replacement of all hydroaggregates. HPP covers 9% of the total energy demand of Turkestan province. It is envisaged that this indicator will increase to 15% after modernization.

¹⁵ Joint mission of ADB, U.S. Department of Agriculture and the Michigan State University

¹⁶ As part of the project "European Union – Central Asia Water and Environment Cooperation" (WECCOP2)

¹⁷ Organized by SPCGF and Valmont Industries (USA)

¹⁸ The Agreement was signed in Geneva on June 29, 2018

Verkhne-Baskan HPP-2 (capacity – 8.8 MW, cost – 4 billion tenge) and Verkhne-Baskan HPP-3 (capacity – 4.2 MW, cost – 3.4 billion tenge), plus a hydropower plant along the Kora River (capacity – 29 MW) are constructed in Almaty province. The cascade of seven HPPs is also constructed at the total capacity of 24.8 MW along the Tekes River in the same province. The 18 MW HPP consisting of 5 small plants is constructed in Zhambyl province.

TOO Standard Hydro Power is to construct two cascades of HPPs (total capacity – 18.2 MW, cost – 6.01 billion tenge) in Aksu district, Almaty province and put them into operation in 2021. The project includes the construction of four small HPPs of 14 MW in total along the Buyen River and small HPPs of 4.2 MW along its tributaries (Koksai and Burkettybien). The average annual generation is planned at a level of 89.9 GWh.

Alternative energy. Kazakhstan has made large scale efforts to increase the share of renewables in the total energy generation: 90 RES facilities with the installed capacity of 1050.1 MW are operational. In 2019, 21 RES facilities, 504.55 MW, were put into operation. At the end of the year, 19 wind stations of 283.8 MW, 31 solar stations of 541.7 MW, 37 HPPs of 222.2 MW, and 3 biofuel power plants of 2.42 MW were operational.

In 2019, solar power stations were commissioned in: (1) Karaganda province – the largest solar station in CA with 307,000 solar panels and the capacity of 100 MW and the Gulshat station, 40 MW, with the planned annual generation of 58.6 million kWh; (2) Almaty province – the 100 MW station located 13 km northward from Kapshagai town.

Investments in wind power stations (WPS). The 50 MW WPS was put into operation near the Kostomar village in Akmola province by TOO CATEC Green Energy with the financial support of the Kazakhstan Development Bank (August). The 48 MW WPS was commissioned in Aktyubinsk province. The project was implemented by the Italian investor “Eni” jointly with “General Electric” under support of “Kazakh Invest”.

Construction of the first in CA station, which is over 100 MW, is started in Zhambyl province (July). The project is invested (\$160 million) and constructed by China Power International Holding Limited. 40 wind turbines of 2.5 MW are to be built. It is expected that the station will generate up to 350 million kWh.

Events. (1) [I International business festival – Solar Fest Qazaqstan](#) dedicated to RES development in Kazakhstan (July 4-5); (2) [II International energy supply forum](#) (November 29, Nur-Sultan); (3) XII Eurasian Forum KAZAKHSTAN ENERGY WEEK-2019, during which [III renewables summit](#), panel sessions and roundtables were held. A number of agreements were concluded on construction of solar stations and joint activities and a Memorandum of mutual understanding and cooperation was signed between the Kazakh Ministry of Energy and ADB (September 23-29, Nur-Sultan); (4) The Kazakh delegation took part in the CAREC Energy investment forum and the 1st dialogue of energy ministers, where they discussed the issues of sustainable energy development with the ultimate aim of creating an interlinked and reliable regional energy system. The draft 2030 CAREC Energy Strategy was considered as well (September 20-21, Tashkent).

International cooperation. The following documents were signed: (1) Memorandum of mutual understanding in RES between EDB and the Association of Renewable Energy of Kazakhstan (AREK) (May 16); (2) Memorandum of cooperation between AREK and the Solar Power Europe, as part of which the parties agreed on joint activities for mobilization of investments in green energy projects in Kazakhstan and EU (May 22); (3) Memorandum of mutual understanding on cooperation and support of RES development in Kazakhstan between the Ministry of Energy and AIB (November 28).

Capacity building. Kazakh experts took part¹⁹ in study tours and visited RES entities, including a solid waste utilization unit and a biogas station (April 24-28, Finland); studied experience and RES technology (November 18-22, Denmark).

Environment and Climate Change

Latest developments in legislation. The Law on ratification of the Protocol on pollutant release and transfer registers to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters was adopted (Law No. 279-VI ZPK of 12.12.2019). The access to information will be extended by creating the nation-wide pollutant release and transfer registers.

The public hearing of the draft new Environmental Code was held. The core principles of the Code are as follows: (1) polluter pays and re-

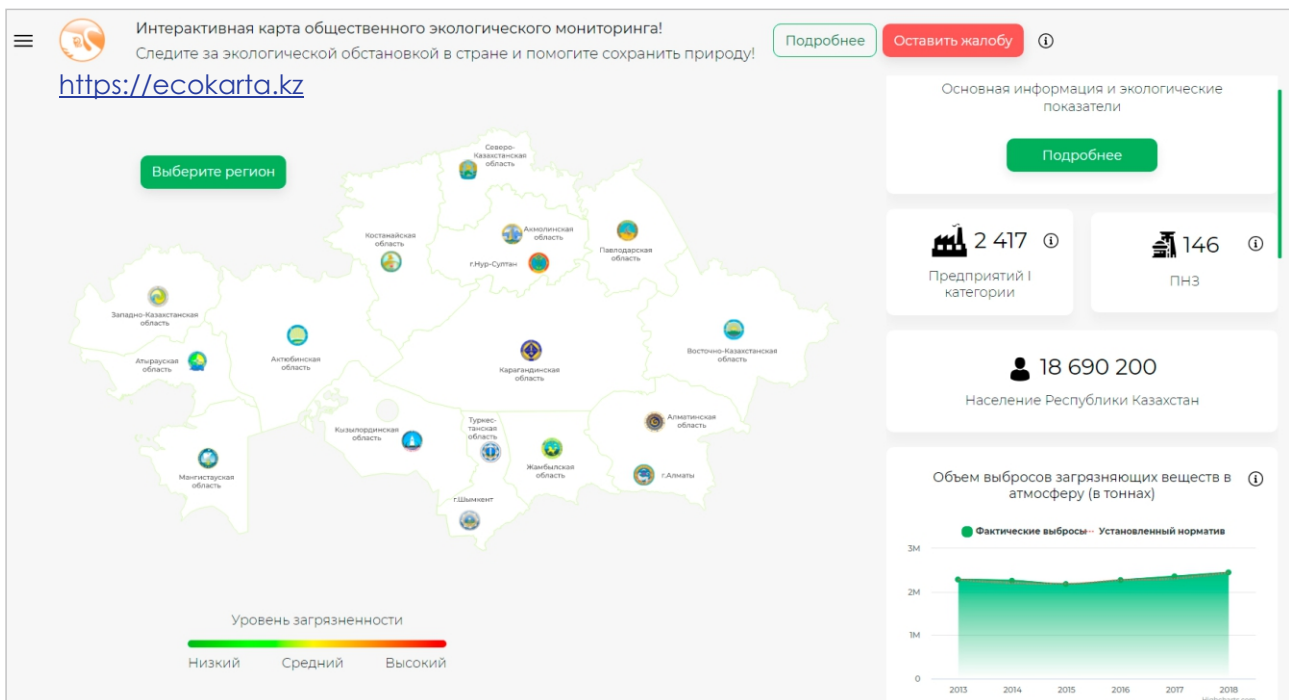
¹⁹ UNDP/GEF Project “[Derisking Renewable Energy Investment](#)”

medies; (2) new approaches to environmental impact assessment; (3) best available technology and economic incentives; (4) emission charges directed to environmental measures; (5) automated monitoring of emissions; (6) stronger environmental control; and, (7) improved waste management. The draft Code was adopted by the Cabinet of Ministers on the 24th of December.

Environmental monitoring. To ensure free access to information on environmental conditions of Kazakhstan, the KazHydromet has developed interactive maps on air and surface water quality.

The maps are available on <https://maps.hydro.kz/> and on the MEGNR's web-site. The information on atmospheric air quality is available in mobile application "AirKZ", which shows the actual data on concentrations of key pollutants in the air of 45 settlements.

An interactive map of the Association of Ecological Organizations of Kazakhstan (<https://ecokarta.kz/>) is designed for the general public. The map contains the information on businesses (emissions), environmental problems in country's regions, and measures taken by central and local authorities.



The development of the **Unified State System of environmental monitoring** is underway as part of the Digital Kazakhstan Program. The system will monitor the status of environment and natural resources and will include specific types of monitoring.

MEGNR and AO "ArselorMittal Temirtau" signed the Memorandum of cooperation on 30% reduction of emissions in 2019-2024 (October).

The rare animal and plant protection program was presented in Almaty. The program financed (\$8 million) by the Key Biodiversity Area Partnership will last for five years and will cover the CA countries and Afghanistan.

Events. The capital of Kazakhstan took part in the Earth's Hour on the 30th of March from 20:30 to 21:30.

The 3rd environmental performance review of Kazakhstan²⁰ was presented in Nur-Sultan (June 5). The report shows progress made by the country in greening the economy, including energy, industry, agriculture and health care; takes stock of Government's efforts in air pollution reduction, water quality improvement, waste reduction and specially protected natural area management; and, gives recommendations for the future.

Capacity building events included among others: training on "Water quality management: EU experience" (April 11-12, Nur-Sultan); an international roundtable dedicated to determination of the key needs and improvement of hydrometeorological services in the region (May 28, Almaty); a [seminar](#) on climate change mitigation and adaptation in CA (September 26-28, Almaty).

²⁰ www.unece.org/fileadmin/DAM/env/epr/epr_studies/ECE_CEP_185_Rus.pdf

Regional and international cooperation. During the 7th meeting of the Kazakh-Chinese Commission on environmental cooperation²¹ the parties discussed the results of quarterly comparative analyses of hydrochemical data on monitoring of water quality in transboundary rivers Kara, Yertis, Ile, Tekes, Horgos, and Yemel'; the work on prevention of river pollution, etc. The parties also signed the resulting Protocol and approved the Commission's work plan for 2019-2020 (May 14-15, Beijing). The next meeting is to be held in Kazakhstan in 2020.

As part of the Second meeting of the Kazakh-Uzbek joint working group on environmental protection and water quality in the Syr Darya River Basin, the participants summarized the results of water monitoring and exchanged information on identified pollution sources. The participants also agreed to conduct joint monitoring of 28 pollutants; additionally study pollution sources and initiate projects with the involvement of international organizations (CAREC, OECD, UNDP, etc.). It is planned to invite Tajikistan and Kyrgyzstan to activities on preservation of the Syr Darya River (November 7-8, Nur-Sultan).

Emergencies

Natural disasters. The dam of Kenesara reservoir broke in Burabai district, Akmola province (at 04:25 on March 31). The situation in the province was tense but stable. In Petropavlovsk, due to overflow along the Ishim River, minor flooding of summer cottages occurred in the floodplain and the international Chelyabinsk-Novosibirsk road was closed (April 19). Because of temperature rise and abundant rainfall, slope runoff of rainwater inundated 270 houses of Pidjim village in the mountains.

Preventive measures. Construction of a joint Kazakh-Chinese mudflow check dam was started on the Horgos River under the Inter-governmental agreement of June 8, 2017. The dam is constructed 5 km upstream of the joint waterworks facility "Dostyk" and will be equally shared by Kazakhstan and China. It is planned to build central concrete and earthen parts of the dam, the control and measurement system, the bag check and drainage canal to pass water during construction, and the bank-protective structures downstream the dam.

As part of preparation to the flood period 2020, the country's regions took the following measures: construction and repair of 163 km of protection dams; bank protection, dredging and training of 330 km of flood-prone rivers; installation of draining ditches along 116 km; cleaning of 2006 km of canals and ditches and 10314 water by-passes under motor and railroad bridges.

SDG in Kazakhstan

Kazakhstan presented its first [Voluntary national review](#) on SDGs during the High-Level Political Forum on Sustainable Development (July 9-18, New York).

Several seminars were dedicated to SDGs in Kazakhstan: on the implementation of SDGs in Kazakhstan for mass media (August 1, Nur-Sultan); "Sustainable development goals and localization approaches at the local level"²² (October 1, Petropavlovsk; November 4, Kokshetau); on SDG 6.4.1 "Change in water use efficiency over time" and SDG 6.4.2 "Level of water stress: freshwater withdrawal as a proportion of available freshwater resources" to build capacities of the participants in developing the indicators and reporting at the national and international levels, organized by UNESCAP, FAO and the Federal State Statistical Service of Kazakhstan (October 8-10, Almaty).

The **First regional SDG summit** "Mobilizing finance for Sustainable Development Goals" was organized by the Kazakh Ministry of National Economy with the support of ADB and UNDP Kazakhstan (November 15-16, Almaty).

Foreign Policy and International Cooperation

In 2019, the President of Kazakhstan paid formal and working visits to the Russian Federation (April, October, November), Uzbekistan (April), Kyrgyzstan (June, November), Tajikistan (June), China (September), USA (September), Armenia (October), Turkmenistan (October), and Germany (December).

Key developments in the foreign policy of Kazakhstan in 2019. A Decree on the concept of foreign policy of the Republic of Kazakhstan²³ was drafted and submitted to the President for

²¹ The meeting was held within the framework of Agreements between the Governments of Kazakhstan and China on protection of water quality in transboundary rivers (February 22, 2011) and on environmental cooperation (June 13, 2011)

²² The seminar was organized by the Institute of Economic Research JSC of the Ministry of National Economy of Kazakhstan with the support of UNDP, ADB

²³ Approved by the Decree of the President No.280 of 06.03.20

consideration. The document outlines country and regional priorities for Kazakhstan.

Development of alliances and strategic partnerships: with RF – in the area of energy, agroindustry and other sectors. The Program of joint actions in the field of Russian-Kazakh production cooperation was signed; with **Kyrgyzstan, Tajikistan, Turkmenistan** and **Uzbekistan** – bi- and multilateral partnerships for interregional and cross-border cooperation, joint solution of environmental problems and efficient use of transboundary water, and in energy, agroindustry and other spheres; with **China** – cooperation in the area of transboundary water sharing, ecology, energy, technological investments, etc.

Promotion of the national interests and reinforcement of the country's image

At the 74th UN GA the President of Kazakhstan K.J. Tokayev presented the country's position on topical issues (September 24, New York). Concerning SDGs, he proposed establishing in Kazakhstan a UN Center for SDG with the mandate to assist the CA countries and Afghanistan (see "[General Assembly](#)"). During the General Assembly, the President of Kazakhstan had a meeting with the UN Secretary General and took the floor at the SDG Summit, where he focused on the importance of modernization of education system, development of green and digital economies and infrastructure. He underlined that 80% of SDGs are integrated into Kazakhstan's strategic programs. The Kazakh delegation also took part in the UN Climate Action Summit 2019 initiated by the UN Secretary General Antonio Guterres (September 23, New York).

The following events were held:

- The **II Kazakhstan-China Interregional Cooperation Forum**, in the course of which a panel session on cooperation in agroindustry and more active trade and investment communications between regions of Kazakhstan and China took place (May 15, Almaty).

- A high-level panel session "[Water as a factor of economic growth and security in Central Asia](#)" was organized at the XII Astana Economic Forum (May 16-17) and focused on the national needs and visions towards sustainable water management through regional collaboration (May 17). The event was organized by the Ministry of Agriculture of the Republic of Kazakhstan and Switzerland's Blue Peace Central Asia initiative, in partnership with the European Union, the World Bank, and the International Water

Assessment Centre. The First Kazakhstan SDG Forum was also organized within the Astana Economic Forum by the Ministry of National Economy of Kazakhstan, Institute of Economic Research, UN agencies, with the support of UNDP in Kazakhstan and the Asian Development Bank.

- A meeting of the working group on National water policy dialogue under the project "European Union – Central Asia Water, Environment and Climate Change Cooperation" (WECOOP) organized with the support of EU and the non-governmental foundation "Water Initiative Center" (June 14, Nur-Sultan). The participants discussed the matters of cooperation on transboundary groundwater, safety of hydraulic structures, prevention of accidental pollution, etc. The key focus was on the reduction of loads on water and energy.

- The conference "Enhancing integration in Central Asia for regional prosperity" coincided with the launching of three new EU regional programs on trade, rule of law and business attractiveness in CA (November 28-29, Nur-Sultan).

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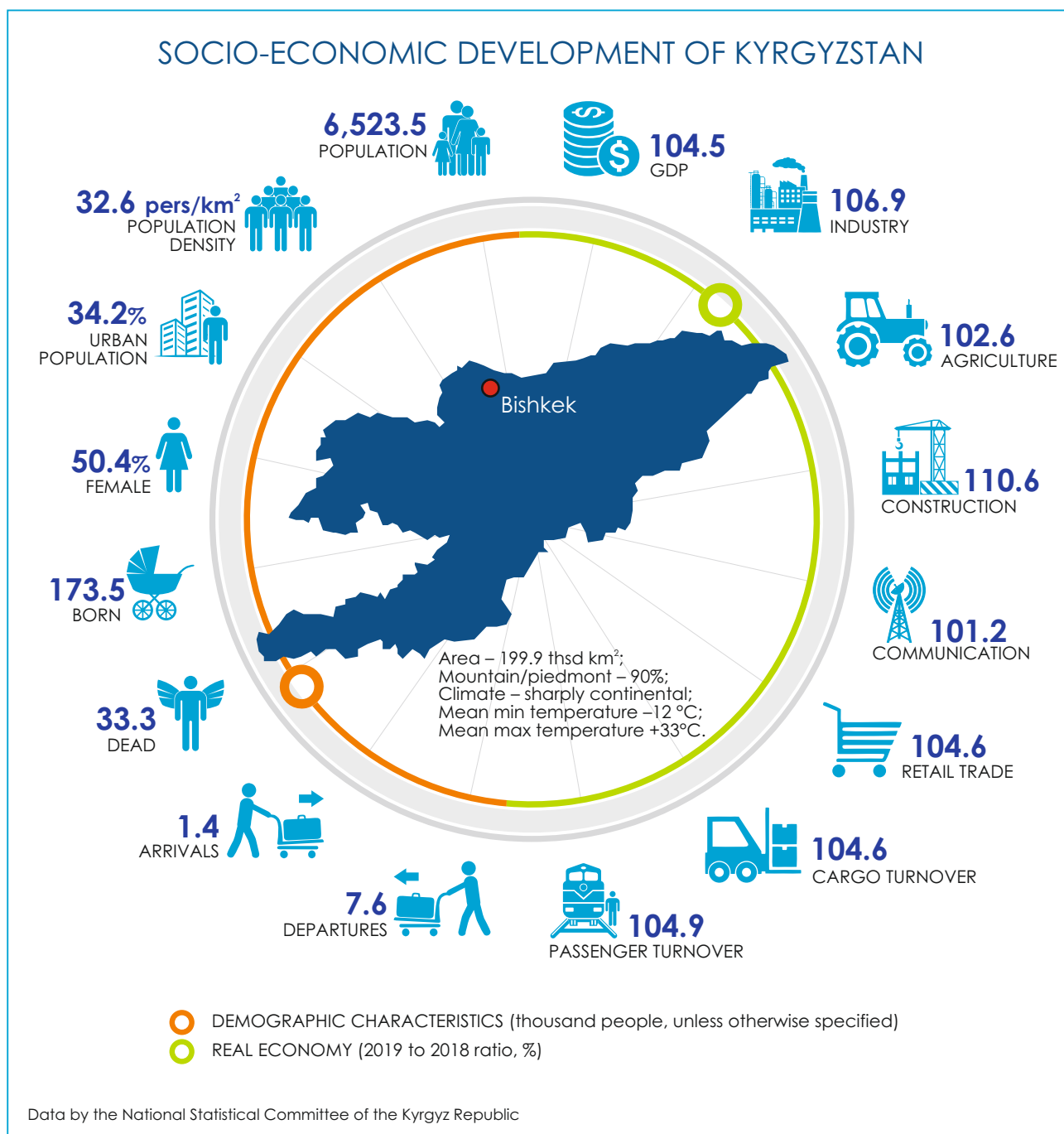
Official sites of:

the President of Kazakhstan (www.akorda.kz/ru);
Ministry of Ecology, Geology and Natural Resources (www.gov.kz/memleket/entities/ecogeo/about?lang=ru);
Ministry of Agriculture (www.gov.kz/memleket/entities/moa?lang=ru);
Ministry of Energy (www.gov.kz/memleket/entities/energo?lang=ru)

Information agencies:

<http://adilet.zan.kz/rus>;
<https://inbusiness.kz/ru>;
<https://ainews.kz/>;
www.kazenergy.com/ru/;
<https://forbes.kz/>;
<https://kursiv.kz/>;
<https://informburo.kz/>;
<https://litter.kz/>

5.2. Kyrgyz Republic



Water Sector

Water resources. The total available water resources in KR are 2,458 km³, including 650 km³ (26.4%) in glaciers, 1,745 km³ (71%) in lakes, 13 km³ (0.5%) as potentially usable groundwater resources, and 44.5 to 51.9 km³ (2%) as average annual river runoff. The flow formation area occupies 7% of the territory. There are about 3,000 rivers and streams with the total annual runoff of approximately 47 km³. The amount of annually renewable groundwater in major artesian basins is within 7.7 km³.

The area of current glaciation is 4% of the country's territory.

The total water consumption in the republic is estimated at 10-12 km³ a year. The water transportation losses in river channels, canals and irrigation structures amount to 1.7-2.3 km³. Owing to natural (mainly relief) conditions, irrigation water is provided mainly by small rivers serving about 800,000 ha or 76% of the total irrigated area. There is minor regulation of mountain runoff: 80,000 ha (11%) are irrigated from regulated sources, while the rest of 720,000 ha, by natural flow.

Public administration reforms. The [State Water Resources Agency under the Government of KR](#)²⁴ was established on the base of the Department for Water Resources and Land Reclamation. The Agency is to regulate relations in the area of water management and use. The **Department for Drinking Water Supply and Sanitation** was transferred to the Agency (PPKR No. 383 of 30.07.2019). Yssyk-Kul Basin Water Authority and Nookan and Alamedin Region Water Authorities have got the status of 'government institutions' in place of 'government-owned corporations' (PPKR No. 42 of 05.02.2019).

Latest developments in legislation. The **Law "On amending some legislative acts of the Kyrgyz Republic (the Water Code and the Law on Water)"** (ZKR No. 44 of 05.04.2019) was adopted to settle the issue of water charges. The Law sets the procedure and terms of charging for usage of water sites and water resources and the procedure of preferences.

Amendments were made in the **Tax Code of KR** that provide tax exemptions for the territories of natural reserves, natural and national parks, water and forest funds, as well as for the land under reservoirs and the areas prone to flooding, except for those allocated for agricultural use (ZKR No. 9 of 23.01.2019); VAT exemptions for tax payers, who supply fodder for poultry and fish for agricultural producers, and for those, who produce poultry and fish (ZKR No. 79 of 08.07.2019); and, profits tax exemptions if renewable sources are used (ZKR No. 99 of 24.07.2019).

An **Agreement** was ratified between the Government of KR and the International Development Association on financing the project "Modernization of Hydrometeorological Services in Central Asia" (ZKR No. 57 of 06.05.2019). The main project goal is building capacities of KyrgyzHydromet to establish the sustainable monitoring infrastructure, improve forecasts and service efficiency in line with the national economic and social needs. The Agreement provides for allocation of \$5 million, including \$2.5 million through grant and \$2.5 million as a loan.

A working group was formed for amending and supplementing legislative acts for the improvement of WUA activities at the Agrarian committee of the Kyrgyz Parliament.

Development of the water management system. The total length of irrigation canals is 29,000 km, of which 5,800 km are the inter-farm canals on the balance sheet of the DWRLR, and 23,200 km are the on-farm canals on the balance sheet of local administration (Aiyl Okmotu), water-users associations (WUA) and other acting legal entities. Kyrgyzstan has 274 irrigation systems and 93 accumulating irrigation structures (reservoirs, basins for decade and daily regulation) on balance sheet of DWRLR. 240,000 ha of land are equipped with the collector-drainage network.

In 2019, construction of basins for daily regulation was completed in Dzhumgal district, Naryn province. As a result, 239 ha of new irrigation land were put in production and water supply of 1,041 ha was improved. In 2020, it is planned to provide with irrigation water additional 4,000 ha in Ak-Tala district and reclaim land through construction of new basins for daily regulation and reconstruction of irrigation canals.

In 2019, the following operations on irrigation infrastructure were completed: repair and rehabilitation of irrigation canals (385.7 km); cleaning of river channels (529.9 km); reconstruction and rehabilitation of 1,131 hydraulic structures and 1,117 gauging stations; repair of 100 pumping stations; and drilling of 15 irrigation wells. It is planned to put into operation 31 irrigation objects for the total amount of \$259.1 million and 27,000 ha of new irrigated land, as well as improve water supply for 40,000 ha until 2023.

In the context of the State Program of Irrigation Development for 2017-2026 aimed at the improvement of irrigation water availability and the expansion of irrigation land, the irrigated area was extended by 1,100 ha in Naryn province, by 1,000 ha in Batkent province, and by 2,000 ha in Talass province.

Water-saving technology. Over 1,100 economic entities on an area of more than 2,400 ha, including 91 economic entities on 76.88 ha in 2019, were equipped with drip irrigation. A draft Decree of the Government of KR "On the approval of the Concept of drip irrigation system development and the Plan of relevant actions for 2019-2025" was developed.

Capacity building. Training courses in updating costs and financial planning in WUAs; operation and maintenance of on-farm irrigation systems;

²⁴ By-laws of the State Water Resources Agency under the Government of the Kyrgyz Republic (in Russian) https://www.water.gov.kg/index.php?option=com_content&view=article&id=227&Itemid=1264&lang=ru

and, assessment of performance and preparation of irrigation infrastructure management plans for WUAs were conducted for the staff of regional WUA support divisions in the southern and northern republican regions as part of the project “National water resources management” (March 6, Osh; March 12, Bishkek).

Drinking Water Supply

Renewal of the Water Supply and Sanitation Strategy of the Kyrgyz Republic until 2026 (PPKR No. 155 of 28.03.2016). The developed draft Strategy was put to a general vote. The draft Strategy includes new sections on the tariff policy, institutional development, sectoral regulation and provides updated statistics. Also, new construction standards providing on average for 80 l/person/day of drinking water were included.

International cooperation and projects. With the support of EBRD, EU and the Swiss Confederation and as part of the national Clean Water Project, large projects are implemented in 20 cities for a total amount of \$160 million, of which more than 65% is allocated in form of grants, while the rest as low-interest credits. Out of 653 villages that need access to clean drinking water 25 villages were provided with clean water through republican budget, while 17 villages has got water supply at the expense of IFIs. It is planned to rehabilitate water supply systems in 24 cities and 248 villages in the next 5 years.

The Project “Improving stability and better natural resources management in Kyrgyzstan and Tajikistan” is implemented with the support of the British Government (UK Aid) and the Aga Khan Foundation in Nookat and Kara-Su districts of Osh province. As a result of construction of water conduits in two villages, 700 households and social structures has got access to clean drinking water in each of the village.

At the Forum “Clean Water for Regions” (May 23, Bishkek), agreements were signed between KR and EBRD on the following projects: “Rehabilitation of water supply in Myrza-Ake, Den-Bulak and Kurshab communities” for an amount of €6 million, including €3 million – EU grant, €2 million – EBRD credit, and €1 million – EBRD grant (ZKR No. 85 of 16.07.2019); “Rehabilitation of water supply and sanitation system in the Jalal-Abad city”, Phase 2, for an amount of €9.275 million, including €4.125 million – EBRD Special stockholder fund, €4 million – EBRD credit, €1.15 million – EBRD grant through technical cooperation funds (ZKR No. 128 of 14.11.2019).

Also, credit and grant agreements were ratified between the Kyrgyz Republic and EBRD

on a number of projects for rehabilitation of water supply and sanitation systems in the cities of Karakol, Kerben and Isfana. The duration of projects is 3 years. As a result, more than 62,000 people will get access to safe drinking water.

Relevant credit and grant agreements were ratified with: ADB for wastewater management in Issyk-Kul' (Balykchi and Karmedju cities) for a total amount of \$41.82 million; and, IBD for the improvement of rural water supply and sanitation in Batken and Talas provinces for a total amount of \$20 million.

Additionally, a credit agreement was ratified between KR and the Saudi Development Fund for an amount of \$30 million for 25 years on the project “Development of rural water supply and sanitation”. The project will cover 70 villages in Batken and Talas provinces to serve about 146,000 people and will be implemented during 4.5 years. Co-financing of \$10 million by the Government of KR is also included.

Agriculture

Irrigated agriculture. According to the Ministry of Economy, the total cropped area was 1,216,700 ha in 2019 or by 1,800 ha more than in 2018. About 87,000 ha of irrigated land are in poor condition. 730 ha of new irrigation land were put in production and 1,395 ha of land were equipped with improved irrigation system in the course of the year.

Latest developments in legislation. The Law on Agriculture Development in KR (ZKR No. 7 of 16.01.2019) was amended. The amendments make provision for annual preferential loans to be provided for agricultural producers (crop production, livestock breeding, poultry farming, beekeeping) and fish farmers.

The Law “On state dotation of seed farming” (ZKR No. 22 of 02.02.2019) was adopted to support and introduce the mechanism of state dotation of agricultural goods producers with the aim of provision of certified seeds and creation of favorable conditions for Kyrgyz seed farms for the production and sale of certified seeds of priority crops.

A number of programs were approved: the **“Program for the establishment and development of agricultural trade logistics centers in KR for 2019-2023”** to create favorable conditions for agricultural producers by increasing their competitiveness and improving export capacity of the Republic (PPKR No. 321 of 27.06.2019); the **“Program of food security and nutrition in KR**

for 2019-2023", which sets requirements and restrictions to be integrated into health, education, economic and social sector development programs (PPKR No. 320 of 27.06.2019); the **"Framework program for phytosanitary security in KR for 2019-2023"** (PPKR No. 354 of 18.07.2019) and **"Rules of phytosanitary zoning in KR based on harmful quarantine organisms"** (PPKR No. 432 of 27.08.2019).

Projects. For further development of livestock farming, crop production and agricultural product processing through the provision of available resources and preferential loans, the "Financing agriculture-7" project was approved (PPKR No.28 of 28.01.2019). In 2019, more than 9,900 preferential loans were given for over 5.1 billion som of the Republican budget, funds of commercial banks and credit organizations.

The five-year [USAID Agro Horizon Project](#), \$22 million, designed to boost the agricultural sector was completed. The project assisted in creating more than 65,000 tons of additional annual processing capacity of agricultural products in Osh, Jalal-Abad, Batken and Naryn provinces and helped to generate 1,400 full-time jobs.

The Kyrgyz Government and the International Fund for Agricultural Development started designing the project "Sustainability of livestock farming" for an amount of \$60 million for five years. The project has three components aimed to improve pasture and forest management, achieve safe agricultural production, and involve youth and women in economic activity.

Regional and international cooperation. 12 agreements for \$349.7 million and 9 export contracts for \$67.5 million were signed between the Kyrgyz Ministry of Agriculture, Food Industry and Land Reclamation (MAFILR) and Russian entrepreneurs at the 8th Russia-Kyrgyzstan **Interregional Conference "Towards New Horizons of Strategic Partnership and Integration"** (March 27-28, Bishkek).

The **Forum "Agricultural Export and Food Security in the Kyrgyz Republic"** organized with the technical and financial support of the WB Project "Agricultural productivity and nutrition improvement" focused on the matters of improving export capacities of agricultural products, food security and improving food quality, including the development of export chain: farmer-production-sale-... (October 4, Bishkek).

Fishery development. In 2019, over 8.7 billions of valuable fish species were released into fishery water bodies, and 1,700 tons of commercial fish were produced in the republic.

The Program and Plan of actions for fishery and aquaculture development in the Kyrgyz Republic were approved for 2019-2023 (PPKR No. 546 of 15.10.2019) and the Decree of the Government of KR "On the development of fishery and usage of natural and manmade water bodies and reservoirs in the Kyrgyz Republic" was amended to change the list of natural water bodies and reservoirs allocated for fish farming (PPKR No. 67 of 19.02.2019). A Memorandum was signed between the MAFILR and the Korea Maritime Institute on cooperation in the fishery sector.

Environmentally friendly agricultural production. For further development of organic farming and application of advanced technology in this area, the "Kyrgyzagrobiocenter" was reorganized into the Organic Agriculture Department at MAFILR.

Memorandums of cooperation were signed with OOO "ECOROST" and OOO "INTER-TRANS" for production of organic fertilizers and feed additives and for production of bio-organic preparations "Moljer-Kg", respectively.

The area of 617,200 ha was surveyed to **identify pests, diseases and weeds** and, consequently, chemical treatment of 204,000 ha was performed. Over 156,000 ha were surveyed to identify the larvae of locusts and more than 114,000 ha were treated.

Energy

Latest developments in legislation. The draft Law "On ratification of credit and grant agreements between the Kyrgyz Republic and ADB on the Uchkurgan HPP Modernization Project" was considered and adopted in the first reading (PJK No. 3475-VI of 26.12.2019). The project totaling \$100 million (\$60 million – credit, \$40 million – grant) will modernize the outdated equipment and increase generating capacities of the plant from 180 to 216 MW.

Amendments were made to the **Law "On renewable energy sources"** that provide tariff preferences only to new RES-using objects. Also the mandate of an authorized body for RES development and promotion and the economic and institutional-legal mechanisms of incentives for RES were determined (ZKR No. 99 of 24.07.2019, Article 2)

Additional agreement was ratified to the Agreement on the provision of an investment loan of \$100 million by the Eurasian Fund for Stabilization and Development for the Toktogul HPP Rehabilitation Project, Phase 2. According to the Agreement, the funds allocated for the

replacement of two hydroaggregates will be also used for the replacement of other two remaining hydroaggregates, while the total project sum and financial conditions will be kept the same.

Regional and international cooperation. The following documents were signed: (1) the Charter of the permanent commission for the interstate use of the Orto-Tokoy (Kasansay) reservoir in Ala-Buka district, Jalal-Abad province under the Agreement between the Governments of the Kyrgyz Republic and the Republic of Uzbekistan of 06.10.2017; (2) the Memorandum of Cooperation between the Kyrgyz Agency for investment protection and promotion and the Russian electric group "Ruselprom" for an amount of \$1.5 billion. It is planned to mobilize investments for a package of hydropower projects, including the construction of small and large HPPs.

Investment projects and programs. The energy sector will have about 30% of the total state investments in 2020. This will account for 113.9 billion som for the following projects: "Reconstruction of Atbasha HPP" (Switzerland – 376.3 million som); "**CASA-1000**" (WB EIB, IDB - 6,679.9 million som); "Improvement of energy supply to Arka scheme in Leilek district, Batken province" (IDB – 126.9 million som); "Commissioning of the second aggregate of Kambarata HPP-2" (EDB – 239.5 million som); "Second and third rehabilitation phases of Toktogul HPP" (ADB, EDB – 2862 million som); "Reconstruction and construction of pumping stations" (EBRD – 321.4 million som), etc.

Small HPP. By expert estimations, the country has capacities for construction of 63 small HPPs at 180 MW for generation of up to 1.1 billion kWh.

Only 1.27% of the **hydro-resources** of small rivers are **developed** in the Republic. 17 small HPPs are operational. Two small HPPs were built but not put into operation on the coast of Issyk-Kul Lake. Resources of irrigation reservoirs, canals and rivers are not used for electricity production.

In this context, **the Strategy of Sustainable Industrial Development in the Kyrgyz Republic for 2019-2023** (PPKR No. 502 of 27.09.2019) envisages measures for the development of small hydropower. It is planned to resume work on two HPPs in Ton district, Issyk-Kul province (June 2020); construct small HPP "Karakul", 18 MW, in Jalal-Abad province (until 2022); construct and put into operation small HPP "Chon-Aksuu" in

Issyk-Kul province and "Chon-Kemin-1" in Choo province at the capacities of 18 and 8 MW, respectively (until 2023); etc.

Environmental Protection and Climate Change

Latest developments in legislation. The Law "On prohibition of activities related to geological surveying of subsoil resources with the aim of finding, exploring and developing uranium and thorium deposits in the Kyrgyz Republic" was adopted (No. 139 of 14.12.2019) to protect population health and environment and ensure radiological and environmental safety.

The Concept of forestry development until 2040 was approved (PPKR No. 231 of 27.05.2019). The Concept is based on SDG 15 on the protection of terrestrial ecosystems.

The Kyrgyz Parliament adopted a draft Law "On amending certain legislative acts on biosphere protection in the area of Lake Issyk-Kul" that will impose a ban on activities of recreation and industrial sites that are not equipped with sewerage and treatment facilities.

Also, the following laws were adopted: (1) "On joining the Agreement on the establishment of the Global Green Growth Institute signed on 20 June 2012" (09.12.2019); (2) "On ratification of the Protocol on joining to the Agreement on Movement of Ozone-Depleting Substances and their Products and Recording Ozone-Depleting Substances in Mutual Trade between the Member States of the Eurasian Economic Union dated 29 May 2015" (09.12.2019).

Nature conservation measures. A draft of Governmental Decree "On the freeze in production and sale of commodities (bags, pockets, packs) made of polymer film less than 20 µm for population (end consumer)" was designed to prevent environmental pollution and reduce polymeric packaging wastes.

SAEPF²⁵ held with the support of UNDP/GEF the annual international ecological event "March movement for parks 2019" under the slogan "Let's preserve flora and fauna area!".

Regional and international cooperation. A treaty was signed with the German Union for Conservation of Nature (NABU) on environmental cooperation for a period until 2029.

²⁵ The State Agency of Environmental Protection and Forestry

During the 2nd meeting of the Russia-Kyrgyz working group for implementation of the Memorandum of Environmental Cooperation signed between the Ministry of Natural Resources and Ecology of RF and the SAEPP, the parties have approved the Plan of actions for 2019-2020, agreed on organization of a seminar for exchange of information and experience in the environmental impact assessment, state environmental expertise and best available technologies (February 27-28, Bishkek).

An agreement was reached with EBRD for allocation of the grant of €5.7 million for recultivation of the former uranium production sites and a Memorandum on implementation of Green Cities Program was signed by the Bishkek city administration for cooperation in the development of an Action Plan in response to identified environmental problems through strategic measures and investments in sustainable infrastructure (May 24, Bishkek).

Climate change. The Republic supports initiatives contributing to the development of a national adaptation plan, particularly, collection and generalization of information on effects of climate change in the country and identification of adaptation capacities at the sectoral level. Law “On Ratification of the Paris Agreement within the United Nations Framework Convention on Climate Change signed on 12 December 2015” was adopted.

Loan and grant agreements with ADB on the Climate Change and Disaster-Resilient Water Resources Sector Project were ratified (ZKR No. 88 of 18.07.2019). The Project totaling \$43.6 million will strengthen the climate change and disaster resilience.

As part of the National Climate Forum titled “Issues of Climate Change in Kyrgyzstan: post-Paris Actions and the Role of Civil Society”, leading experts drafted a list of recommendations to the Government for the development of concrete measures and determination of appropriate institutional structure to promote climate solutions in line with the Paris Agreement (December 17, Bishkek).

The [Climate Finance Center](#) was launched (May 23). The main goals of the Center are: assistance in developing a national strategy on climate change; coordination and attraction of climate finances; development of projects; capacity building, training and awareness raising in the area of climate change and financing.

The following events were held: (1) the first Youth climate forum of Kyrgyzstan, which brought together more than 350 university students, senior pupils, young professionals and eco-activists from different regions of the country (December 6, Bishkek); (2) an International seminar “Modeling climate change in Central Asia” organized by the EU Central Asian Research and Education Network (CAREN) Project jointly with the Institute of Water Problems and Hydropower of Kyrgyzstan and the Central Asian Institute for Applied Geosciences (May 16-17, Bishkek).

Green economy. The Program of Green Economy for 2019-2023 was adopted and set priorities of sustainable development and concrete objectives, including adaptation to climate change. The jubilee Forum “Green economy – strong regions – sustainable development of the country” was held as part of the [Green Economy Week 2019](#) (November 11-17, Bishkek).

Emergencies

Natural disasters. Over the half of the Republic territory is prone to avalanches. The area of 3,200 km² is subjected to flooding.

In 2019, as a result of flooding, more than 20 households, as well as on-farm roads and bridges in villages of Naryn province were damaged (January, February) and dwellings, social sites and agricultural land in Yntimak village of Suzak district were at risk of submerging.

The mud and stone slide in April damaged 3 km of an on-farm road and flooded 2.6 km of an on-farm ditch. Mudflows also damaged villages in Osh province (May, June) and in Issyk-Kul province (August).

Preventive measures. In 2019, the Ministry of Emergencies undertook bank-protection, preventive and damage control measures in 430 sites; protected more than 22,500 dwellings and households, over 13,900 ha of agricultural land, 63 km of on-farm roads, 7 bridges, etc.

International cooperation on the risks of transboundary disasters. The **first joint meeting of emergency ministries of Kyrgyzstan, Tajikistan and Uzbekistan** addressed a wide range of issues, presented recent progress, identified shortcomings and proposed improvements in joint coordination (April 5, Bishkek). Following the Protocol signed at the meeting, joint international training drills in transboundary emergency response took place (September 24-25, Tuura-Tash, Batken province).



A month of disaster risk reduction was organized all over the Republic (September-October). Additionally, awareness raising campaigns dedicated to emergency threats and self-protection methods, as well as scientific conferences, roundtables, and exercises took place at the republican level.

Foreign Policy and International Cooperation

In 2019, the President of the Kyrgyz Republic paid formal visits to Germany (April), Switzerland (July), UAE (December), Saudi Arabia (December) and working visits to China (April), Kazakhstan (May), Saudi Arabia (May), Japan (October), the Russian Federation (July), Tajikistan (July, September, December), Azerbaijan (October), and Uzbekistan (November).

The country was visited by the President of RF (March), Chairman of PRC (June), President of Kazakhstan (November), Foreign Minister of RF (February), Special EU Envoy on CA (April), President of Mongolia and Prime-Minister of India (June), President of Tajikistan, Prime-Ministers of South Korea and Kazakhstan (July), Prime Minister of Uzbekistan (August), President of Belarus and Prime Minister of Armenia (November).

Key developments in the foreign policy of Kyrgyzstan in 2019. The Concept of foreign policy of Kyrgyzstan approved by the President's Decree of March 11, 2019 sets priorities of foreign policy and national interests of the Kyrgyz Republic.

The key priorities of the foreign policy included: strengthening of relationships with neighboring countries, allies and strategic partners and development of cooperation with EEU

member states; enhancement of trade and economic links, particularly for attraction of investment in SME. Priorities of economic diplomacy included: enhancement of export capacities; attraction of investments; and, protection of country's economic interests.

Development of alliances and strategic partnerships: with **Kazakhstan** – settled border and trade issues and discussed matters related to water, veterinary, and phytosanitary; with **Tajikistan** and **Uzbekistan** – delimitation of state border; with **Turkmenistan** – the work on fuel-energy and investment spheres.

Chairmanship in SCO, CSTO and CCTSS²⁶. More than 60 events were organized during the SCO Summit in Bishkek (June). The most important meetings included those of the Council of the Heads of SCO Member-States, the Council of foreign ministers, and the Contact group "SCO-Afghanistan".

The chairmanship of Kyrgyzstan in CCTSS was marked by the launching of the Council's European office in Budapest (September 19) and joining of Uzbekistan to the Council's membership during the 7th CCTSS Summit (October 15, Baku).

Promotion of the national interests and reinforcement of the country's image. For the first time, Kyrgyzstan was elected to the UNESCO Executive Board for 2019-2023 at the 40th session of its General Conference (November 20, Paris). During the 208 session of the Executive Board, the Kyrgyz delegation voiced the focus areas as a member of the Board, such as climate change, glacier melting, mountain ecosystem preservation, etc. (November 29, Paris).

In connection with the launch of the new EU Strategy on Central Asia, the [EU-Central Asia Forum](#) took place on July 5-6 in Bishkek. The aim of the event was building on the positive experience from the inclusive consultation processes and creating a new forum for dialogue. Another important objective of the event was to increase the understanding of EU objectives and values in the region.

As part of the official visit of the High Representative of the Union for Foreign Affairs and Security Policy Federica Mogherini to Kyrgyzstan, a draft Agreement on the extended partnership and cooperation between the Kyrgyz Republic and the European Union was initialled

²⁶ Cooperation Council of Turkic Speaking States

and a Financial agreement on education was signed for an amount of €35.76 million for 2019-2021 (July 6-7).

The [15th EU-Central Asia Ministerial Meeting](#) took place on July 7 in Bishkek. The new EU Strategy on Central Asia adopted by the EU Member States on June 17, 2019 was presented and the participants discussed its implementation through concrete programs and initiatives. The Kyrgyz Republic put forward a proposal to host the first EU-Central Asia Economic Forum that should become an effective mechanism of trade, economic and investment cooperation between EU and CA.

At the High-Level Forum “Accelerating Reforms for Sustainable Development” the participants addressed topical issues of development in Kyrgyzstan (November 19, Bishkek).

Sources:

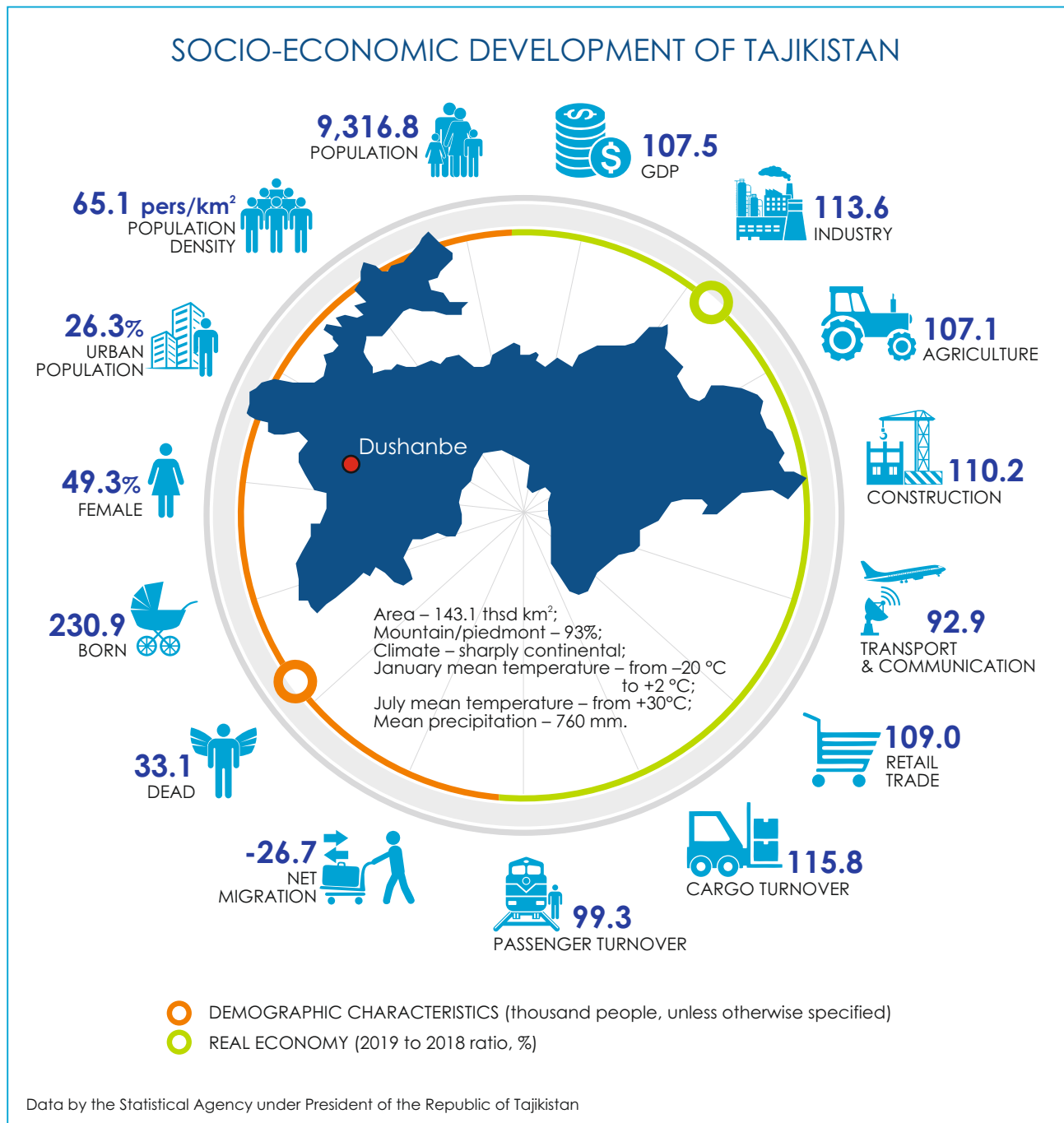
Official sites of the:

President (www.prezident.kg);
Parliament (www.kenesh.kg);
Ministry of Justice (<http://cbd.minjust.gov.kg>);
Ministry of Energy and Industry (<http://energo.gov.kg>);
State Agency of Water Resources (<https://www.water.gov.kg>)

News sites:

<http://barometr.kg>;
<https://24.kg>;
<https://ru.sputnik.kg>;
<http://kabar.kg>

5.3. Tajikistan



Water Sector

Water resources. Tajikistan's water resources are comprised of glaciers, rivers, lakes, reservoirs and groundwater. There are 14,509 glaciers with the total area of glaciation of 11,146 km² (approx. 8% of the country's area) and the total glacial volume of about 845 km³. 947 rivers stretching to more than 28,500 km flow across the country. The main watercourses are the Amu Darya and the Syr Darya and their tributaries. The average annual runoff generated in Tajikistan is 64 km³/year

(62.9 km³/year in the Amu Darya basin and 1.1 km³/year in the Syr Darya basin) or 55.4% of the average annual surface runoff in the Aral Sea Basin. Tajikistan possesses about 1,300 lakes covering 705 km². The lakes contain over 46.3 km³ of water, including 20 km³ of freshwater. The potential groundwater stock is 18.7 m³/year, while usable groundwater resources are estimated at 2.8 km³/year.

Latest developments in legislation. The Law "On the Water Users Association" was adopted (ZRT

No. 1668 of 02.01.2020)²⁷. The Law determines economic, institutional and legal frameworks of WUA and aims to ensure water conservation and efficient operation of hydraulic structures in the WUA's service area.

Implementation of national programs. Development of the water-management system. The work was continued on the draft **National water strategy of the Republic of Tajikistan for a period up to 2030**. The Strategy is to guide implementation of IWRM in the Republic and assist in the achievement of water-related SDGs and the implementation of the National Development Strategy 2030.

Implementation of the National water sector reformation program for 2016-2025 was continued. River basin organizations (RBO) and River basin councils were established. Basin water management plans have been drafted for the Syr Darya, Zarafshan, Panj, and Kafirnigan basins. The second meeting of the Kafirnigan River Basin dialogue on IWRM was held to discuss progress and status of RBO, development of the basin plan for the Kafirnigan River, data requirements and collection, and other matters. (March 28).

In line with the Decree "On measures for reclamation of irrigated agricultural land in the Republic of Tajikistan for 2019-2023" (PPRT No. 374 of 01.08.2018), the efforts have been made to clean channels and offtakes, repair irrigation canals, and equip the water supply network.

The irrigated area of 761,500 ha is served by 29,800 km of irrigation canals, 13,100 km of wells and collecting drains, 7427 hydraulic structures and 505 deep wells. The organizations of the Agency for Land Reclamation and Irrigation provided services equivalent to 3660.6 Mm³ by farmers' requests over 8 months in 2019.

391 operational WUAs serve 395,100 ha or 51.3% of agricultural land in Tajikistan. The total fees collected from water users amounted to 36.7 million somoni or 51% of the provided services. This is by 2.7 million somoni less than in 2018. The debt of farms before irrigation organizations was 21.9 million somoni by September. If one accounts the debts for previous years, the total debt would be 143.7 million somoni.

Projects. In 2019, six investment projects on land reclamation and irrigation were implemented for a total amount of \$165.4 million in Tajikistan:

- "Irrigation of Dangara scheme", Phase 3. The Project will help to create 8,000 new jobs. The irrigated area will be used for cotton (900 ha), forage crops (100 ha), cereals (350 ha), horticulture (300 ha), and vegetables (100 ha).

- "[Tajikistan second public employment for sustainable agriculture and water resources management project](#)", which includes the rehabilitation of irrigation and drainage infrastructure and the technical assistance for legislative and institutional reforms of the sector. The Project is implemented in 14 districts of Khatlon province.

- The Project "Increasing resilience of the Panj River Basin to climate change" aims to rehabilitate the infrastructure of irrigation system and water supply networks, ensure protection from floods and adaptation to climate change. The Project covers 18 jamoats (local communities).

- "[Water resources management in the Panj River Basin Project](#)", which will help to transform the Agency for Hydrometeorology into sustainable and well-resourced agency, with the purpose of improving the forecasting of extreme weather events (floods) in the River Basin.

- "Zarafshon irrigation rehabilitation and river basin management" Project and "Strengthening Critical Infrastructure against Natural Hazards".

- A financial agreement signed with the OPEC Fund for an amount of \$10 million for implementation of the Khatlon Province Water Management Improvement Project, which is to improve water management in the context of climate change and assist to boost agricultural production, increase farmer's incomes and access to water. The Project will be implemented till 2025.

Capacity building. In the course of the year, several training events were held: training on "Water quality management: EU experience"²⁸ (June 5-7); training "IWRM: theory, practice and prospects in river basins of Tajikistan" in each catchment of Aksu-Isfana-Tomchasai-Khojabakirgan-Arkasai sub-basins (June 10-13); roundtable "Raising awareness of decision makers about IWRM mechanisms in the Tajik area of the Syr Darya basin" (September 24); training "IWRM: theory, practice and prospects in river basins of Tajikistan" at local administrations of Matcha and B. Gafurov districts and Kanibadam and Istaravshan cities of Sogd province (November 4-8).

²⁷ ZRT No. 213 of 21.11.2006 "On the Water Users Association" has become invalid

²⁸ As part of the Project "EU-Central Asia enhanced regional cooperation on environment, climate change and water" (WECOOP2)

In order to strengthen the institutional and technical capacity, the Ministry of Energy and Water Resources of Tajikistan, the Tajik Agrarian University named after Shirinsho Shohtemur and CAREC signed a [memorandum](#). One of the main areas of work will be the creation of the Innovations and Scientific Research Cluster on IWRM to strengthen water professionals' capacity, promote research and assist in application of research results (March 5).

Regional and international cooperation. The first joint Tajikistan-Kyrgyzstan meeting of Small Basin Councils was held on the small transboundary rivers of Isfana and Aksu with the aim to enhance transboundary cooperation and exchange information and experiences (September 12, Gulistan).

The Tajikistan National Commission on Irrigation and Drainage held the 7th meeting on the "Scientific development in the area of land reclamation and irrigation" on the occasion of the 3rd World Irrigation Forum (September 27).

The second Women's Water Forum was held within the framework of the 11th Syr Darya Basin Dialogue (December 28, Gulistan). The Forum was dedicated to the "Role and prospects of women's participation in integrated water resources management in the Tajik part of the Syr Darya River Basin".

Drinking Water Supply

Latest developments in legislation. The newly adopted **Law "On drinking water supply and sanitation"** (ZRT No. 1633 of 19.07.2019) sets the legal, institutional, economic and social framework of drinking water supply and sanitation, as well as the state guarantees to meet the demand for drinking water and sanitation and ensure quality and safety.

Projects and programs. Activities under the Clean Drinking Water Program for 2008-2020 were continued. In particular, new water supply lines were put into operation in Kaltachanor village in Khatlon province to cover 4,000 people and in Varsik village in Sogd province to provide access for 3,570 people. Also, the 7.2 km long drinking water conduit "Khazorchashma-Gonchi", including two reservoirs capable to store 700 and 150 m³, was commissioned in Sogd

province and provided access to clean water for more than 26,000 people. A pumping station was launched in Oftobroi village as well.

The wastewater treatment station was rehabilitated in the Khujand city. This helps the Khujand public utility to improve the quality of water discharged into the Syr Darya River. Additionally, 180,000 dwellers of Sogd province has got access to clean drinking water and better water services. The joint investments of EBRD and SECO²⁹ in this project amounted to \$8.85 million.

In 2019, the World Bank allocated grants in the amount of \$30 million for the rehabilitation of water supply and sewage infrastructure in Dushanbe and \$58 million for the improvement of water supply and sanitation in 7 districts of Khatlon province. Over 400,000 people will get access to clean drinking water and 100,000 people will be provided with improved sanitation facilities.

New projects for a total amount of \$558,000 were approved as part of the Japanese Government aid package (February). The projects provide for a water supply system in Abdulvosiev community of Rushan district, construction of an irrigation canal in Khudfigi Soya village of Gorno-Matchinskiy district and other assistance.

Agriculture

In 2019, the **agricultural production** reached 26.6 billion somoni or over \$2.6 billion. This is by 7.4% more than in 2018. Crop production grew 3.6% (\$261 million), while the growth in the livestock breeding sector was 5.4% (\$96.3 million). The rates of crop and livestock production growth amounted to 7.8 and 6.4%, respectively. The country's agriculture produced more than 1.3 million tons of grain, 993,000 tons of potato, 398,700 tons of raw cotton, etc. The total export of agricultural products was over \$18 million or by \$1.7 million more than in 2018.

Latest developments in legislation. Among the laws adopted in 2019 are: (1) the **Law "On pastures"**, which regulates public relations in pasture management, use and protection (ZRT No. 1618 of 20.06.2019)³⁰; and, (2) the Law "On the provision of population with nutritional food and drink" (ZRT No. 1635 of 19.07.2019), which regulates public relations in the area of nutritional food provision and sets the institutional and legal

²⁹ [The State Secretariat for Economic Affairs](#)

³⁰ The previous Law on Pastures No. 951 of 2013 has become invalid

framework for prevention of micronutrient deficiency and related diseases.

The **National food safety strategy** is being developed. The draft Strategy was discussed at the 2nd meeting of the Intergovernmental technical working group and the meeting of the Co-ordination development council (May 8). The Strategy summarizes the country vision and long-term goals for the provision of safe and good-quality food and protection of consumers from food related risks at both domestic and export markets.

Implementation of programs and decrees. As a result of implementation of the Presidential Decree “On the additional measures for re-organization and reformation of agricultural entities” and the Law “On dekhkan entities (farms)”, the number of dekhkan entities reached 185,616 by the end of 2019. In the first half of the year, the farms got 390 units of new agricultural equipment. In total, 27 639 units of agricultural equipment were recorded in farms by July 1. Also, 85 equipment service centers were established.

New orchards and vineyards were established on an area of over 3,000 ha within the framework of the **Horticulture and Viticulture Development Program 2016-2020**. This accounts for 97% of the plan.

As a result of implementation of the **Fishery Development Program 2009-2022**, the area of fish-breeding basins has extended to 3,013.99 ha, and the production capacity has increased from 214 to 273 tons of fish a year.

International cooperation and projects. The **Financial Agreement** was signed with the German Development Bank for an amount of €9.6 million on the development of the agricultural sector.

FAO with the EU's support and in close collaboration with the Agency for Hydrometeorology of Tajikistan's Committee for Environmental Protection established a pilot agrometeorological network of 3 automatic [agrometeorology stations](#). The weather stations have been installed in regions with specific crop patterns – vineyards in Tursunzoda district, apricots in Konibodom district, and cotton in Jaloliddin Balkhi district. Each station has different characteristics and transmits the data every 10 minutes via mobile communication to the Agency for Hydro-meteorology.

As part of the [“Enhanced Competitiveness of Tajik Agribusiness Project”](#) (EU/EBRD), semi-

nars and training in modern farming technology (drip irrigation, plant protection, etc.) were organized. To test high-yielding forage crops, special demonstration plots were arranged and field days were organized for exchange in farming methods.

The [Agriculture Commercialization Project for Tajikistan](#) (WB) organized training workshops, offered consulting services and built capacities of institutions. As a result, the Project supported more than 1000 farmers and SMEs in the rural area.

Energy

Electricity production and export. Tajikistan possesses an inexhaustible reserve of hydropower. About 95% of electricity is generated by hydropower plants. In 2019, Tajikistan generated more than 18.7 billion kWh of electrical power (17.4 at HPP and over 1.2 at TPP), which is 5.2% more than in 2018. Out of daily generation of 53-55 million kWh, the country exports over 11 million kWh, including 6.2 million kWh to Uzbekistan, 4.5 million kWh to Afghanistan, and 0.4 million kWh to Kyrgyzstan. The total electricity export increased by 23% as compared to 2018. By the end of 11 months of the year 2019, the revenue amounted to more than \$91.3 million.

Latest developments in legislation. The Governmental Decree “On electrical and thermal energy tariffs” (No. 329 of 22.06.2019) approved the tariffs of OJSC “Barqi Tojik” for consumers. According to the Decree, the cost of electricity for population has increased almost by 17% to 22.66 diram or 2.1 cent per kW against the past year.

The debt of OJSC “Barqi Tojik”, the largest unprofitable state enterprise in the Republic, amounted to 23 billion somoni or \$2.4 billion by the beginning of 2019. The Government of Tajikistan has applied to the World Bank and other partners for the financial support of the financial recovery plan of OJSC “Barqi Tojik”. This would require about \$1.2 billion. The restructuring process of the company has also started. It is to split the company into three separate companies for generation, transmission and distribution.

HPP construction and modernization

Rogun HPP. The first aggregate underwent routine inspection and preventive maintenance from February to May. As of July, the aggregate generated daily up to 3.9 million kWh. In 2019, according to the Ministry of Finance, 2.1 billion somoni or \$222.6 million were allocated from the

state budget for the construction of Rogun HPP. Since the beginning of the construction, the state budget allocated 24 billion somoni for the plant. The second aggregate was commissioned in September.

Sarband HPP. The second aggregate of HPP was commissioned in September. The modernized hydroaggregate produces 50 MW instead of previous 45 MW. The assembling of the third hydroaggregate of 49 MW will be completed by the end of 2020. After reconstruction, by 2022, the capacity of five out of six aggregates of HPP will reach 270 MW, against the current capacity of 240 MW.

Nurek HPP. The “Nurek HPP Rehabilitation Project” was started on March 20 and is to be completed in 2023. The first stage includes the replacement of 3 aggregates and their ancillary equipment plus auto-transformers and the operations on dam safety. The project's total cost is \$326.9 million. As a result of implementation, the design capacity of the plant will be increased from 3000 to 3300 MW, and, generally, the generation will increase by 700 MW.

Kairakkum HPP. A project on modernization of Kairakkum HPP was launched at the expense of EBRD by the consortium comprised of General Electric Hydro (France), General Electric Renewable (Switzerland) and Cobra Instalaciones Servision SA (Spain) (August 23). The total cost of the project, which is to be completed by the end of 2023, is \$196 million. As a result of modernization, the current installed capacity of the plant will be increased from 126 to 174 MW.

Small HPPs. EU allocated €20 million for the construction of Sebzor HPP, capacity 10 MW, along the Shokhdara River in Roshtkalinskiy district of GBAO. The plant is to generate up to 60 million kWh annually.

CASA-1000. The construction of structures of the regional high-voltage transmission line was started. The Swedish company ABB will build a converter substation in Sangtuda. The Indian company Kalpataru Power Transmission Ltd started constructing the transmission line in the north of Tajikistan, the line from the Regar substation to the converter substation and further to the border with Afghanistan. The construction of the infrastructure is estimated at \$351 million. The Tajik part of the project will be implemented at the expense of WB, EBRD, IDB, and the Government of Great Britain. The World Bank has allocated grant financing of \$24 million for the improvement of energy infrastructure in 60 villages of Sogd and Khatlon provinces

and the Districts of Republican Subordination located along the CASA-1000 project (March). It is also planned to build an electricity substation and distribution network in the Isfara city.

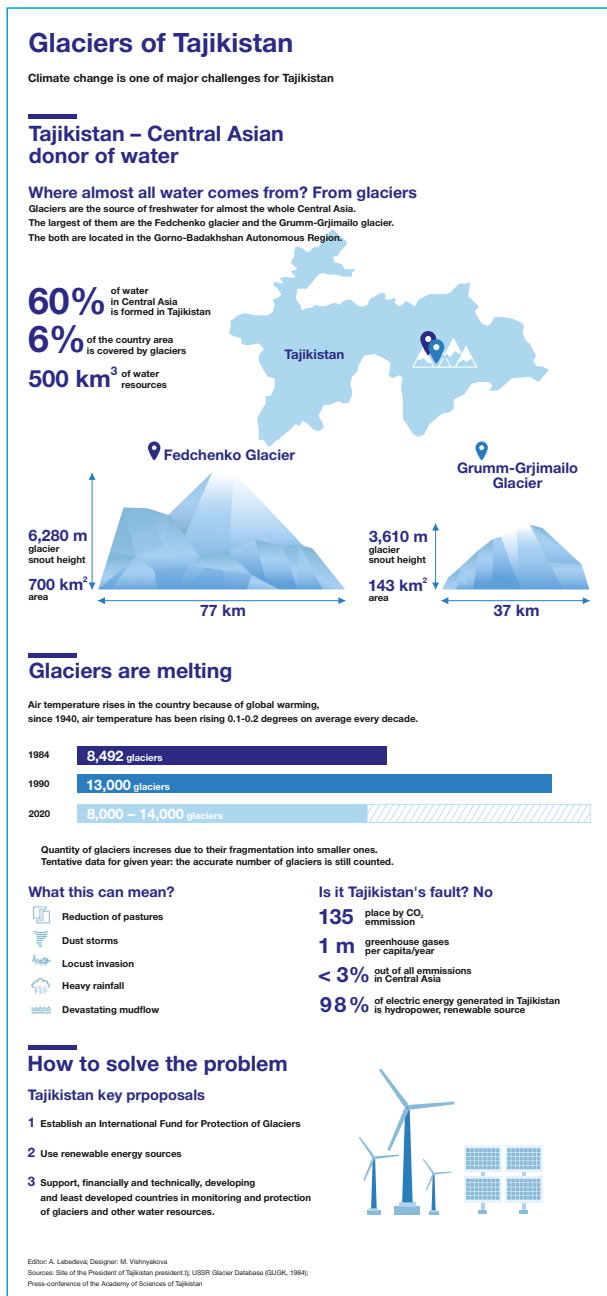
Climate Change, Glaciers and the Environmental Protection

Latest developments in legislation. (1) The Governmental Decree “On the National Adaptation Strategy until 2030” was adopted in October. The Strategy aims to support the economic growth and boost modernization of all economic sectors, ensure diversification and strengthening of global market, and enhance economic competitiveness of Tajikistan by increasing adaptation capacity and energy efficiency in the Republic; (2) The Governmental Decree “On the establishment of the Coordination Council at the Government of Tajikistan to deal with the matters related to the Green Climate Fund” was adopted in August. The Council is to regulate and coordinate activities between the public agencies and organizations and the Green Climate Fund (GCF) and to harmonize the environmental interests of the state and organizations.

International cooperation and projects. An Agreement was signed between GCF and ADB in support of the development of practical hydrological and meteorological data and information in Tajikistan to overcome institutional deficiencies of the Agency for Hydrometeorology.

EBRD launched a new financing mechanism of \$25 million to increase resilience and mitigate climate change (November 21) in the form of loans for investing in highly effective technologies contributing to better water, energy and land use in the Republic.

Glaciers. In 2019, as part of implementation of the “State Glacier Study and Preservation Program 2010-2030”, the Agency for Hydrometeorology and the Center of Glacier Studies at the Academy of Sciences of Tajikistan undertook research expeditions to Rama glacier (October 15-26) and Zeravshan glacier (October 15-26) in the Zerafshan River basin; Zulmart glacier in the Karakul lake basin; and, Didal glacier in the Surkhov River basin and others to monitor the status of glaciers. An automatic weather station equipped with data recording and storage sensors on annual basis was installed at the elevation of 4,500 m at Zulmart glacier. The Didal glacier was investigated with the use of drones and GPS. Now, the Center is drafting the Glacier Atlas of Tajikistan.



Source:
<https://tj.sputniknews.ru/infographics/20200211/1030696645/ledniki-tajikistan-istochniki-voda-centralnaya-asia.html>

Tajikistan was included in the World Glacier Monitoring Service (WGMS) in 2019.

Capacity building. The following training events were held: training course on the improvement and application of MODSNOW-Tool for the staff of the Agency for Hydrometeorology as part of the WB CAMP4ASB Project (December 28, 2018-January 31); workshop “Capacity building and

resource management of the Agency for Hydrometeorology” under the Panj River Basin Management Project (ADB, GCF) (August 21); workshop on the “Assessment of readiness of Tajikistan to the adoption of the emission monitoring, reporting and control system” (August 26).

Events. (1) A campaign on environment and glacier protection in the context of climate change, organized with the support of the Embassy of Germany for the students of secondary and general education institutions of Kazakhstan, Kyrgyzstan and Tajikistan (October 5-12); (2) campaign “Let’s protect our glaciers”, where representatives of ministries and departments, research institutes and students participated (October 25-26); (3) International scientific conference “The dust and the haze in Central Asia” that brought together climate experts from 18 countries (April 8-12, Dushanbe).

Emergencies and Disasters

Emergencies. In 2019, the Tajik Committee for Emergency Situations and Civil Defense recorded 680 emergencies (167 ones in 2018) of natural origin, of which 46 ones caused damage to population and national economy: 24 cases (51.2%) of mudflow; 8 cases (17.4%) of avalanches; 5 cases (10.9%) of rock fall; 2 cases (4.3%) of strong wind; 2 cases (4.3%) of landslide; 1 case (2.2%) of lightning; 1 case (2.2%) of water level rise in rivers. As a result, 22 people died and 136 dwellings were damaged.

Preventive measures. The **State bank protection program 2018-2020** is implemented in the Republic. In 2019, the bank protection efforts were completed along 28.771 km for an amount of 86,634,700 somoni.

As part of implementation of the **National Disaster Risk Reduction Strategy 2019-2030**, two meetings of the National Platform for disaster risk reduction³¹ (April 30, December 6) were held. In the course of the meetings, the reports on measures for prevention of natural disasters and for bank protection, aero-surveys of snow cover in mountains, results of geological surveys of hazardous sites, epidemiological situation, joint coordination in disaster prevention within the framework of the REACT, the Rapid Emergency Assessment and Coordination Team, as well as implementation of disaster risk reduction programs and projects in Tajikistan were presented.

³¹ Established for implementation of recommendations of the Hyogo Framework for Actions

Projects. Within the WB's Strengthening Critical Infrastructure against Natural Hazards Project, river embankments were built and bank protection and rehabilitation efforts were made along an irrigation canal. The Project also includes the modernization of crisis management centers and the improvement of the seismic hazard assessment capacity of the Institute of Seismology and Earthquake Engineering for more accurate disaster risk identification. The \$50 million project implementation period is 2018-2023.

The ADB [National Disaster Risk Management Project](#) will conduct dam-break analysis and flood modeling of Sarez Lake, upgrade the monitoring and early warning system, and make an inventory of glaciers. The project will also help to develop a 9-year investment plan (2022-2030), along with recommendations for a viable financing mechanism for disaster management to ensure sustainable financing and long-term engagement of the government and development partners in addressing disaster challenges in the country. In 2019, a roundtable on project progress and further steps was held and a training course was conducted in building the resilience to natural disasters, new methods of disaster reduction and development of a gender-sensitive Roadmap. The total cost of the project is \$11 million, with the Government of Tajikistan providing \$1 million. The project is to be completed in 2024.

International cooperation on transboundary disaster risks. The Tajik delegation took part in the **First joint meeting of emergency ministries of Kyrgyzstan, Tajikistan and Uzbekistan** (April 5, Bishkek), the regional meeting of the heads of emergency agencies of CA states (July, Bishkek), and the joint international training drills in transboundary emergency response (September 24-25, Batken province, Kyrgyzstan).

Foreign Policy and International Cooperation

In 2019, **the President of Tajikistan paid official visits** to the Russian Federation (April), Belarus (June), Switzerland (November), France (November) and working visits to PRC (May), Kazakhstan (May), Kyrgyzstan (July), Turkmenistan (October), Uzbekistan (November), and the Russian Federation (December).

Development of alliances and strategic partnerships. Cooperation is expanding with **Afghanistan** in the area of standardization, energy, water, oil and gas, emergency prevention,

and environmental protection; **Kazakhstan, Kyrgyzstan, Turkmenistan and Uzbekistan** in the area of energy, water use efficiency, agriculture, transportation, etc.; **Belarus** in agriculture and machine building.

During the visit of the President of Tajikistan to the Russian Federation, the 7th Tajikistan-Russia interregional cooperation conference took place and addressed the issues of agriculture, trade and investment, industry and infrastructure, and humanitarian cooperation.

Chairmanship in international organizations. Tajikistan assumed the responsibility of chairmanship in the Conference on Interaction & Confidence Building Measures in Asia (CICA) for the period 2018-2020. It hosted the [Fifth Summit of CICA](#), which adopted a [declaration](#) (June 15, Dushanbe), and a meeting of the Senior Officials Committee (December 18-19, Chongqing, China).

At the Central Asia – Japan Dialogue, the 7th meeting of foreign ministers took place (May 18, Dushanbe). The participants discussed the matters of cooperation in the field of investments, trade, tourism, development and regional security and, finally, adopted a Joint statement.

Tajikistan also assumed the responsibility of chairmanship in the **Interstate Council on Geodesy, Cartography, Cadastre and Remote Sensing** and hosted the XLI session of the Interstate Council (September 17-19, Dushanbe). The results of the intersessional period of working groups on spatial data infrastructure, coordinates and elevation reference systems; the results of the development of the “Dictionary of modern terms used in the field of geodesy, cartography, geographic information systems, cadastre and remote sensing of the Earth” and other matters were summed up at the session.

Tajikistan took over the **IFAS chairmanship** for the period of 2019-2022 according to the decision of the Second Consultative Meeting of the Heads of CA State (November 29, Tashkent). The President Emomali Rahmon will be chairing IFAS over that time.

Implementation of the International Decade for Action “Water for Sustainable Development” 2018-2028. In 2019, the International Conference “Water unites” was organized by the Ministry of Energy and Water Resources of Tajikistan in collaboration with the International Institute for Cultural Diplomacy and the OSCE Office in Tajikistan (March 18). The following scientific-practical conferences were held as part of the

initiative: “Water as a source of life” (March, Khojent); “Tajikistan – a source of clean water” (March, Dushanbe); “Land reclamation and irrigation development” (September, Dushanbe); “Water diplomacy and its inclusive factors in media relations in Central Asia” (December, Dushanbe), and others. Finally, there is ongoing preparation to the second International High-level conference on the implementation of the International Decade of Action to be held in Dushanbe in 2020 (meeting of the Organizing Committee held on November 25).

Promotion of the national interests and reinforcement of the country's image

Upon Tajikistan's initiative, the side-event “Transformative water actions to accelerate global achievement of climate change related goals” (September 25) and a high-level event on interlinkages between water and climate action (March 27) were held on the margins of the 74th session of UN GA in New York.

The President of Tajikistan spoke at the 40th session of UNESCO General Conference on the issues related to climate change (November 12, Paris) and took part in the Paris Peace Forum.

The First Deputy Minister of economic development and trade of Tajikistan moderated the 13th meeting of the SPECA Working group on trade (July 4, Geneva). In particular, the SPECA Regional Trade Facilitation Strategy was discussed at the meeting.

Sources:

Official sites of the:

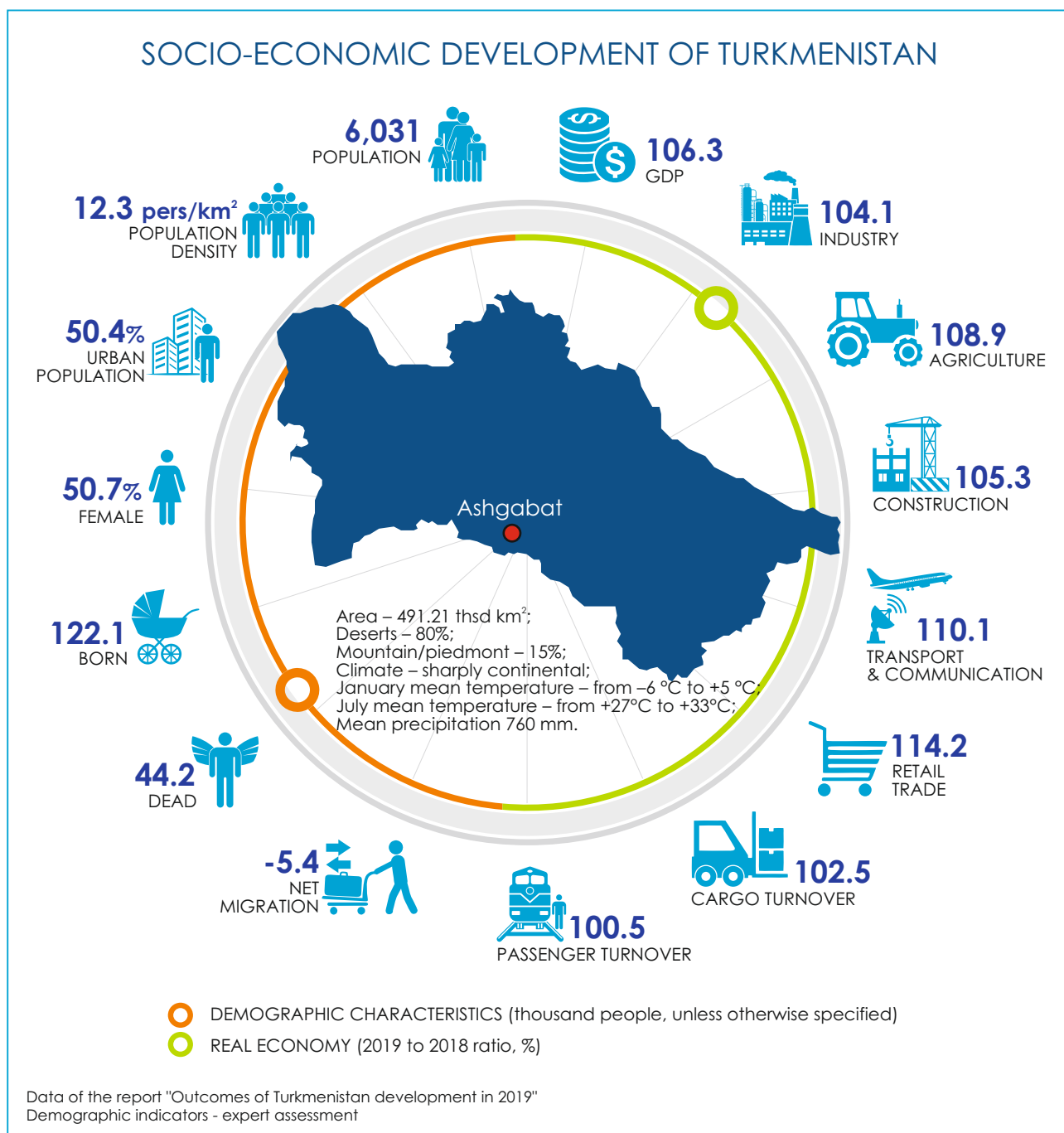
President (www.president.tj);
 Ministry for Foreign Affairs (<https://mfa.tj/ru/>);
 Ministry of Economic Development and Trade (<https://medt.tj>);
 Committee for Emergency Situations and Civil Defense (<https://khf.tj>);
 Agency for Land Reclamation and Irrigation (<https://www.alri.tj/ru/#>);
 Agency for Hydrometeorology (<http://www.meteo.tj/>);
 Ministry of Energy and Water Resources (<https://www.mewr.tj/>);
 Ministry of Agriculture (<https://moa.tj/ru>)

Information agencies and sites:

<http://khovar.tj>;
www.dialog.tj;
<https://east-fruit.com>;
<https://tajikta.tj>;
<http://avesta.tj>;
<https://tj.sputniknews.ru>;

<https://fergana.agency>;
<http://sugdnews.com>;
<http://eco.uz>;
<http://base.spinform.ru>

5.4. Turkmenistan



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 Atrak Sumbar and Chandyr (1.4%) rivers, as well as the small water-courses of the northeast slopes of Copetdag (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 are formed outside the country.

Public administration reforms. The **Ministry of Agriculture and Environment Protection (MAEP)** and the **State Committee of Water Management** were established by the Decree of the President of Turkmenistan of 29.01.2019 on the base of the Ministry of Agriculture and Water Resources of Turkmenistan and the State Committee for Environment Protection and Land Resources. The National Committee for Hydrometeorology at the Cabinet of Ministers was transferred to the jurisdiction of MAEP and renamed as the **Service for Hydrometeorology**; the Agricultural Research Institute of MAEP was

placed under the authority of the Turkmen Agricultural Institute and renamed as the **Agricultural Scientific-Production Center**. All entities of the newly established MAEP are transformed into joint stock companies.

The **Law “On land reclamation”** was amended and supplemented (08.06.2019) in part of authorities of the newly established bodies for agriculture and environmental protection and for water management.

Improvement of available water supply. The work on **construction of new and modernization of existing reservoirs** was continued. Two reservoirs with the total capacity of about 0.063 km³ for drinking, industrial and agricultural purposes are under construction on the Karakum River. It is also planned to extend the Karakum River channel to 200 km and deliver water to the desert land of Balkan velayat (province).

The second stage of construction of Turkmen Lake “Altyň Asyr” is underway and includes activities on the increase of flow capacities of the Head collecting drain and the Dashoguz branch, the construction of hydraulic structures and bridges, and the fixation of movable sand along waterways. The experts of the Institute of Chemistry at the Academy of Sciences of Turkmenistan have carried out hydrochemical research of the collector-drainage water on the system of Lake “Altyň Asyr”. Based on the research results, the ecological maps were generated to guide the development of crop farming, livestock production and fishery in the arid area.

The **Concept of Development of the Turkmen Lake “Altyň Asyr”** region for 2019-2025 and the relevant Plan of Actions were approved. The Concept includes measures for the rational use of water resources and the development of Karakum desert, afforestation of the latter, the development of livestock farming and fisheries, and the expansion of pastures. This activity will be based on scientific research aimed to increase biodiversity, improve environmental conditions in the region, treat and use efficiently the lake’s water.

The **official stone-laying ceremony for a new village near Lake “Altyň Asyr”** was held with invitation of representatives of diplomatic corps accredited in Turkmenistan, international organizations and experts, national and foreign media on May 8. The ceremony was followed by a scientific-practical conference, which addressed the role of the Turkmen lake in environmental and socio-ecological development of the country.

The Danish company “Grundfos” audited more than 120 pumps, with the resulting recommendations on the optimal placement of suction and pressure lines of pumping stations and the efficient usage of power equipment. Related seminars were organized on optimization of pumping station operation and the improvement of water use monitoring ([July](#), [December](#)) as part of the project **“Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan”**.

To **build capacities** of water-management organizations, provincial and district authorities, daikhan (farm) associations and to exchange experience in efficient water management and introduction of advanced developments, the following events were organized: a roundtable (March 19); international conference “The role of water diplomacy in achieving sustainable development in Central Asia” (June 5); a seminar “Climate change and water resources management: international practices and Turkmenistan’s capabilities” (July 18-19); a [seminar](#) “Use of innovative technologies for sustainable water management in Central Asia” (November 14-15); a [workshop](#) on mutually beneficial cooperation through innovative technologies in rational use of water and energy resources (December 17).

By the decision of the Board of Governors of the World Water Council, the **Turkmenistan State Committee for Water Management entered the membership of the Council** (October 22, Cairo).

Drinking Water Supply

“The General Clean Water Program” is ongoing in Turkmenistan. The **Law “On drinking water”** was amended and supplemented. Particularly, an article that determines the duties of water supply organizations was added. In line with the amendments made in the Law, the Cabinet of Ministers sets the drinking water and sewage collection service tariffs for population and approves quantities of drinking water provided for population.

The hydrogeological field office at the State Corporation “Turkmengeologiya” explores new sources of freshwater and updates freshwater reserves. Water-treatment facilities capable of processing 30,000 m³/day were put into operation in Akhal velayat and will help to fully meet the demands of local settlements.

A new water-distribution station, capacity 30,000 m³/day, was commissioned in Geoktepa

etrap (district). The station is fully automatic and its equipment and units can be controlled remotely.

A new water-treatment network, design capacity 30,000 m³, is close to completion in Khalach etrap, Lebap velayat. The first section of the main water conduit, 12.5 km long was constructed in Kunyaurgench etrap of Dashoguz velayat.

For trouble-free supply of Ashgabat's population with clean water, it is planned to construct two water-treatment plants, the design capacity of which is 150,000 m³ and 250,000 m³, respectively.

Agriculture

Agroindustry reformation and modernization. The **Country Socio-Economic Development Program 2019-2025** was adopted (01.02.2019). The Program includes a number of strategic areas: (1) structural transformation of industrial sectors and services through accelerated adoption of new technologies; (2) reduction of state-ownership entities through privatization and their transformation into joint stock companies; (3) structural transformations of enterprises (also through digitization); (4) improvement of the marketing strategy. The document provides for country's GDP growth by 6.3% in 2019 and 8.2 % in 2025. By that time, the industry should account for 33.8%; agriculture, 8.9%; construction, 11.5%; and, services, 45.8% in the GDP structure. Over 2019-2025, the total investments in capital assets will be 229.3 billion manats (about \$65.6 billion), of which 91.3% will be invested in the production sphere. By 2025, the foreign trade volume is to reach \$135.2 billion, including export of \$84.1 billion and import of \$51.1 billion. The ministry and sectoral agencies have undergone re-organization after adoption of the Program. To expand the private sector in agroindustry, a **Procedure** for state registration of physical entities doing business without formation of a legal entity was adopted (December 18).

Amendments were made to the **Law "On pastures"** (08.06.2019) concerning powers and functions of MAEP on pasture use and protection.

The chemical industry, which provides the crop production sector with mineral fertilizers, is developed intensively: an agreement was signed with the consortium of Japanese and Turkish companies "On design and construction of a unit for production of concentrated phosphorus fertilizer at the Turkmenabat chemical plant" (October).

Rational methods of irrigation and crop growing are also actively introduced. Particular attention is paid to the development of agrobiotechnology, selection and seed breeding.

Within the framework of the **Decree "On further agricultural reforms"** (26.09.2018), the public purchasing price of wheat increased twofold. The cotton prices were set depending on quality characteristics of raw cotton. Farmers were provided with the following opportunities: minimal land fee; preferential conditions for getting agricultural inputs; allocation of land plots for usage for 99 years; soft credits for the period of up to 10 years.

The John Deere International GmbH company and AO Uzsanoateksport deliver **agricultural machines and equipment**. MAEP has bought spare parts for agricultural machines «CASE» and «Synder» and laser levelers «LGI Omega».

As part of implementation of the **Concept of digital economy development for 2019-2025**: a concept was approved for the transfer of agricultural machines to telematic digital system in three stages over 2019-2022. A Memorandum was signed with the John Deere company for equipping of agricultural machines and facilities with the digital electronic control system over 2020-2030. It is planned to establish a Control center with provincial and district local observation points for data collection, storage, analysis and processing. The testing of «John Deere 6,195M» tractors equipped with digital telemetric systems was completed in some districts of Akhal velayat.

The privatization process of livestock farms is underway. Particularly, in 2019, four livestock production enterprises in Akhal, Lebap and Mary velayats were privatized by the members of the Union of industrialists and entrepreneurs of Turkmenistan.

The following events were organized in the course of the year: the Turkmenistan's agriculture achievements exhibition and the International scientific conference "Achievements and critical tasks to be solved next in seed production of Turkmenistan" (May 16); a seminar on innovative horticulture (July 24); practical training for agronomists and horticulturalists (November 26-28).

Within the framework of the EU project "Promoting further sustainable development of agriculture and rural area in Turkmenistan – SARD III", the workshops were conducted on the improve-

ment of performance of small livestock producers (April) and efficient irrigation water distribution and use (August) and a study tour was organized to the Cordova University (July, Spain).

Energy

The Turkmenenergo State Corporation at the Ministry of Energy has in its structure 12 power plants of the total established capacity of 5,178.4 MW: Abadan, Ashkhabad, Akhal, Avaz, Balkanabad, Gindukush, Dashoguz, Dervez, Lebap, Mary, Seid, and Turkmenbashi. The country is entirely self-sufficient in electricity and even exports it to Iran and Afghanistan.

In line with the **Concept of energy sector development in Turkmenistan for 2013-2020**, new power facilities are constructed and outdated facilities undergo reconstruction and modernization. Gas turbine power plants have been included into the sectoral infrastructure.

The Turkish company «Çalık Enerji Sanayi ve Ticaret A.Ş.» repairs steam turbines to increase capacity of the Mary power plant from 650 to 1000-1200 MW.

The consortium of «Çalık Enerji Sanayi ve Ticaret A.Ş.» and «Çalık Enerji Swiss AG» (Switzerland) is to put into operation the **Energy Equipment Repair and Maintenance Center** in the area of the Byuzmein state power plant in 2022.

Gindukush HPP on the Murgab river marked 110 years. This still operating plant, with the capacity of 1.2 MW, is also a historical site.

Alternative energy³². Turkmenistan shifts to green economy and environmentally safe and resource saving technologies in industry and social sectors as part of the **National energy saving program 2018-2024**. The Law "On renewable energy" is being developed.

Solar units, with the total capacity of 10 kW, were installed³³ in three outer settlements in the central part of Karakum desert. Solar panels of 5kW were installed in Dashohuz velayat by «Täze energiýa» company jointly with UNDP. The company has mastered the technology of glass solar panel production and intends to launch this production.

Education in the field of RES is provided at the State Energy Institute of Turkmenistan (SEIT). The Institute includes the Scientific-Production Center "Renewable energy", which carries out research and has a plan of actions on the use of solar and wind energy in the area of Lake "Altyn Asyr". A Memorandum of cooperation was signed with the Seoul National Science and Technology University (April). The Institute of Solar Energy at the Academy of Sciences of Turkmenistan was transferred to SEIT (January 29).

Energy cooperation development. The following related meetings and events took place: meeting with the [delegation](#) headed by the Secretary General of the Energy Charter (January 22); the [15th meeting of the Task Force](#) on RECA (March 27-28); a [trilateral meeting](#) on energy cooperation between Turkmenistan, Azerbaijan and Turkey. The Joint Declaration was signed upon completion of the meeting (April 19, Istanbul); a roundtable on RES development organized by the OSCE Center and USAID (April 25-26); a roundtable "The role of international cooperation in RES development" (August 1). The International energy exhibition and the scientific conference "Primary areas of energy sector development in Turkmenistan" were held (September 12-14). A meeting was held with the delegation headed by Mr. Bruno Balvanera, EBRD Managing Director for Central Asia ([January 30](#), Ashgabat) and addressed the EBRD strategy for Turkmenistan for 2019-2024, progress and further steps of implementation of the TAPI project and Trans-Caspian gas pipeline.

Environment and Climate Change

Implementation of national strategies and programs. A new version of the National Strategy of Turkmenistan on Climate Change (NSTCC)³⁴ was adopted on September 23. NSTCC is aimed at the development of effective measures contributing to low carbon country development, adaptation of priority sectors and ensuring of economy resilience, including food, water and environmental security. The new Strategy revises and supplements the sections concerning actions, financing and monitoring and evaluation mechanism. Particular attention is paid to education, training, as well as to climate change awareness raising and mobilization of private sector and civil society. A conference was

³² In October 2018, Turkmenistan became a full member of the International Renewable Energy Agency (IRENA, <https://www.irena.org/aboutirena>)

³³ As part of the UNDP/GEF project "Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan"

³⁴ Developed with the technical assistance of UNDP. The previous version was adopted in June 2012

held to discuss the tasks of sectoral agencies in the context of the newly updated Strategy (September 26).

The adopted **Law “On environmental auditing”** (02.03.2019) contributes to greening and eco-efficiency of economic entities. The state regulation in the area of environmental auditing is under responsibility of the Cabinet of Ministers and MAEP. The environmental auditing is performed, obligatorily or voluntarily, by environmental auditors or resident auditing organizations on contract basis.

The **Law “On wastes”** was supplemented and amended (08.06.2019). In particular, a concept of “waste danger passport” was introduced, clarifications were made regarding agencies that develop and approve tariffs of the services related to waste collection and transportation, and provisions on passportization of wastes were added.

As part of the **National Forest Program** (2013-2020) aimed at creating green belts, the afforestation campaigns took place in spring and autumn.

The Regional program “Ecosystem-based approach to land use and biodiversity conservation in the Amu Darya lower reaches” started to be implemented in Turkmenistan³⁵ (Lebap velayat). Attention will be paid to tugai pastures. Bio-geographical mapping and training for the staff of the nature reserve on the impact of climate change on agriculture and ecosystems are also planned. Relevant seminars were organized within the framework of the Program ([June 7](#); October 1-3).

The **National Strategy for Biodiversity Conservation** (2018-2023) is implemented in Turkmenistan. A Cooperation Agreement was signed between the Government of Turkmenistan and the World Wildlife Fund. MAEP is planning to involve all concerned parties in the solution of environmental issues in the country; efforts are to be made for ecosystem restoration and the development of a network of specially protected nature areas will be supported.

EBRD approved the [Biodiversity Management Capacity Building Program](#), which is to raise the capacity of the Natural Reserves and Protected Areas for the protection of flora and fauna diversity in Turkmenistan.

The following events were held in the course of the year: a seminar for journalists “Climate change and pastures in Turkmenistan”³⁶ (February); a seminar of the UNDP Project “Climate Change Education and Awareness – Climate Box” (April); the Interdepartmental meeting dedicated to the V Kigali Amendment to the Montreal Protocol on substances that deplete the ozone layer (October); the International conference on the “Role of water diplomacy in achieving the sustainable development in Central Asia” (June 5); discussions on international and national environmental laws organized by “Yashyl Shokhle” and “Ynanch-Vepa” (December); a seminar on climate financing (December).

Turkmenistan entered to the Guinness World Records in 2019 for the Largest Ecological Lesson initiated by the Government of Turkmenistan in the Turkmenbashi city.

Emergencies

Floods. The year 2019 broke a record in terms of rainfall quantity in several areas of Turkmenistan that caused **strong flooding along the Atrek and the Murgab rivers** and their tributaries, mudflows in Kopetdag and floods along temporal water drains with accompanied damage.

In March, heavy rainfall fell in Etrek, Makh-tumkuli and Serdar districts. The Atrek River overflowing its banks flooded a vast area. The governments of Turkmenistan and Iran have agreed to protect banks and dredge the channel of the Atrek River. Shower rains in March-April in Mary province led to critical water rise in the Murgab River. Bank protection and embankment operations continued day and night at Middle Gindukush and Lower Gindukush reservoirs located 1.5 m higher of the Mary city. Sariyaz reservoir, with the design volume of 0.26 km³, was almost full. The shower rains have finally damaged grain and cotton fields.

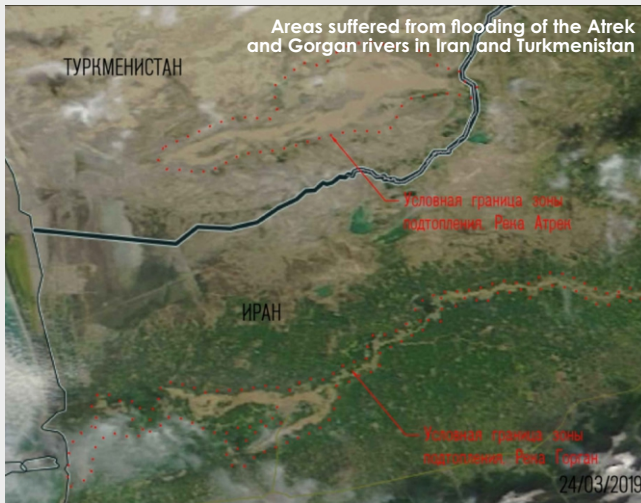
Strong wind. Strong winds accompanied with dust storms are recorded annually in Turkmenistan. In March 2019, a sand storm caused heavy damage to hundreds of houses and buildings in Serakhs. Strong winds were recorded in the west of Turkmenistan, the Karakum Desert, and in the southeast of the country in the course of the year.

³⁵ With the support of MAEP and GIZ

³⁶ Organized by MAEP and GIZ

FLOOD ALONG THE ATREK RIVER

In March 2019, the unusually heavy rains were observed in the southwest and the west of Turkmenistan and in adjacent provinces (Golestan and Mazendaran) in Iran: more than annual rainfall flooded the area in two days.

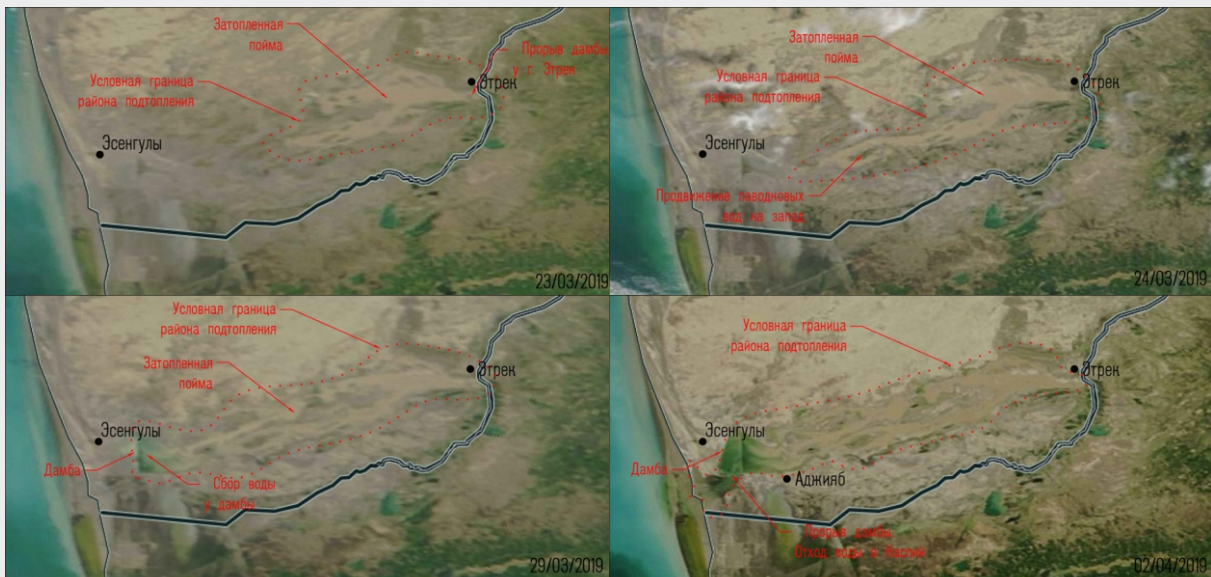


In Turkmenistan, the heaviest rain was recorded in Kyurendag foothills, where the Bereket city is located, and there were heavy rains in Serdar, Makhtumkuli and Etrek districts.

No.	Station	Rainfall
1	Bereket	175.9
2	Serdar	104.0
3	Makhtumkuli	85.0
4	Etrek	59.0
5	Balkanabad	31.0
6	Esenguly	21.0
7	Bal'boser (Iran)	37.1
8	Bodjnurd (Iran)	26.0
9	Gorgan (Iran)	72.2
10	Maraveh-Tappe (Iran)	41.7

The vast area was flooded by overflow water and mudflow. The flood abated quite quickly in the mountain and piedmont regions. Whereas in lowland, the consequences of flooding have been felt for 2-3 weeks. Esenguly and Etrek districts suffered most of all. The overflowing Atrek River flooded large area³⁷. The maximum rainfall quantity that led to flooding of the Atrek River was recorded in Sumbar and Chandyr basins in Turkmenistan and Iran, as well as in the middle basin of the Atrek (Gechedag, Karabaidag ridges, etc.).

The satellite images below show flood water, which broke the dam near the Etrek city (the image of March 23) and started inundating the lowland.



Later (on March 29), the floodwater pooled in a lake at the dam, which protects the Esenguly city. Local emergency services have tried to minimize damage from early. By using pumps and digging channels, they diverted water towards the Caspian Sea.

As a result of flooding, a lot of livestock died, the district was cut of gas and electricity, dwelling and ancillary buildings were damaged.

Source: Internet Journal "Meteojurnal", <http://meteojournal.ru/stihiya/pavodok-na-reke-atrek-v-marte-2019-goda/>

³⁷ The river's length is 670 km. Most of the year the water content in the river is very low, and the lower reaches become dry. Water reaches Esenguly district in winter and spring only

SDGs in Turkmenistan

Turkmenistan is actively pursuing a SDG-related policy in economic, social and environmental areas.

The work on preparation of the Voluntary National Review (VNR) of the implementation of SDGs in Turkmenistan was underway in 2019. As part of this preparation, relevant events were held, including: meetings of the Interdepartmental Commission for preparation of the VNR ([February](#), [April](#), [June](#), MFA of Turkmenistan); the training workshop of UNESCAP and UNDP on "Systems thinking and integration of the Sustainable Development Goals into national planning" ([February](#)); a meeting with winners of the "Young SDG ambassadors" contest ([March 11](#)). [17 young people](#) were selected from all the regions of Turkmenistan to serve as Ambassadors for the Sustainable Development Goals.

The VNR of Turkmenistan outlined the progress on: Goal 3 – good health and well-being; Goal 4 – quality education; Goal 8 – decent work and economic growth; Goal 10 – reduced inequalities; Goal 13 – climate action; Goal 16 – peace, justice and strong institutions; Goal 17 – partnerships for the goals. The first VNR on the implementation of SDGs was launched at the High-Level Political Level on sustainable development held under the auspices of ECOSOC (July 9-18, New York).

As part of SDG actions in the country, a seminar on SDG monitoring and reporting (January 18), a meeting of the National working group for the SDGs (August 28, [December 20](#)), and student debates (October 21) were held.

The Turkmenistan delegation also took part in the [Regional Forum](#) on sustainable development (March 21-22, Geneva); the work of the [6th Asia-Pacific Forum](#) on sustainable development (March 27-29, Bangkok); and the 5th Forum of CIS Country Youth Organizations (December 12-15, Moscow).



Cooperation on the Caspian Sea

The Communiqué adopted at the Fifth Caspian Summit (August 12, 2018, Aktau, Kazakhstan) states the initiative of the President of Turkmenistan to host the First Caspian Economic Forum (CEF) in 2019. In the course of preparation to the Forum, the following events were organized: (1) an International media-forum (February 5, [June 29](#), Ashgabat); (2) briefings and roundtables in a number of countries; (3) an International scientific-practical conference "The Caspian Sea – a sea of opportunities" ([April 11](#), Moscow).

The First Caspian Economic Forum³⁸ was held in the city of Turkmenbashi on August 11-12. The first day of the Forum was marked by the opening of the International Caspian Exhibition of Innovation Technologies and the Exhibition "Turkmen Sahara 2019", the ministerial meeting of authorities responsible for implementation of agreements signed between the littoral Caspian nations; the first meeting of the Turkmen-Astrakhan business council; and, a business forum with business representatives from the Caspian states. An International conference "The Caspian Sea: towards the development of international economic cooperation" was held on August 12. The CEF was completed with the adoption of the Forum's Statement. The next CEF is to be held in Astrakhan, Russian Federation in 2020.



The authorized representatives of the Caspian states met in the course of the year to discuss and agree upon the following draft documents: the [Protocol on cooperation in the area of combatting illegal extraction of biological resources \(poaching\) in the Caspian Sea](#), which is developed in line with the Convention on the legal status of the Caspian Sea (February 25-26); the [Protocol on Cooperation in the Field of Securing Maritime Safety in the Caspian Sea](#) (February 28-March 1); the [Agreement](#) between the governments of the Caspian states on cooperation in conducting search and rescue operations on the Caspian Sea (March 11-13); and the [Agreement](#) between the governments of the Caspian states on cooperation in the field of scientific research on the Caspian Sea (March 14-15).

The **Institute of the Caspian Sea** was established in Turkmenistan for the development of cooperation in the Caspian Sea region, marine research, preparation of international legal and national documents and the review of the im-

³⁸ First CEF website <https://cefavaza2019.gov.tm/>

plementation by Turkmenistan of international treaties on the Caspian Sea, etc. (August 9). The 7th training course "The Caspian Sea – sustainable development and management" was held on March 4-15 in Avaza. The Institute of Chemistry at the Academy of Sciences of Turkmenistan has generated an environmental map of the littoral zone of the Caspian Sea.

Foreign Policy and International Cooperation

In 2019, the country was visited by the President of Afghanistan (February), Minister for Foreign Affairs of the Russian Federation (February), the King of Bahrain (March), the President of Korea (April), the Prime-Minister of the Russian Federation (May, August), and the Prime-Minister of Malaysia (October).

The President of Turkmenistan paid state and working visits to Tatarstan (June), Singapore (August), Japan (October), Azerbaijan (October), Italy (November), and Uzbekistan (November).

Key developments in the foreign policy of Turkmenistan in 2019

Development of alliances and strategic partnerships. Turkmenistan builds relationships with neighboring countries based on the good-neighborliness and equality principles, both in a bi- and multilateral format. Cooperation with Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan is developed in the fuel and energy, water, agricultural, transport and investment spheres.

The **Turkmen-Afghan relations** are developing in the spheres of water use, fuel and energy, transport and communications, etc. The third [meeting of Coordinative Commission on water resources](#) between Turkmenistan and the Islamic Republic of Afghanistan³⁹ was held and considered the issues related to the development and strengthening of transboundary water cooperation (April 11-12, Ashgabat). The event was attended by representatives of the State Committee for Water Resources, the State Border Service, the Garagumderiyasuvkhodjalyk Association, as well as water management associations of the Akhal, Lebap and Mary provinces. The Afghan delegation included the heads and leading experts of the Foreign Ministry, the Ministry of Energy and Water Resources, the Department of Geodesy and Cartography of the Ministry of Urban Development and Land Resources, etc.

Chairmanship in international organizations. Turkmenistan chaired the CIS in 2019. As part of

the chairmanship, Ashgabat hosted the meeting of the Council of CIS State Leaders (May 31); the 83rd meeting of the CIS Economic Council (September 13); meetings of the Council of Foreign Ministers (October 10) and the Council of CIS State Leaders (October 11). Regular consultations were held between the MFA of Turkmenistan and the foreign agencies of other countries. Also, Ashgabat hosted the XIV Forum of Creative and Scientific Intelligentsia of the CIS Member States (May 15-16) and a regular meeting of the CIS Intergovernmental Coordination Council on Seed Production (May 15).



As part of Turkmenistan's chairmanship in SPECA, the country hosted high-level international events "The SPECA Days" (November 18-21). Among them were the forum on trade policy of the SPECA countries, meetings of the working groups of the SPECA on sustainable transport and trade, and the SPECA-2019 Economic Forum (following the forum, the «Ashgabat Initiative» was adopted).

Chairmanship of Turkmenistan in IFAS. The 85th plenary meeting of the 73rd UNGA session has adopted unanimously the Resolution on "Cooperation between the United Nations and the International Fund for Saving the Aral Sea"⁴⁰, which was initiated by Turkmenistan ([May 28](#), New York) (see "[General Assembly](#)"). Twenty one countries co-authored this document. In the period of Turkmenistan's chairmanship in IFAS, the country held: meetings of the RWG on the development of ASBP-4 and the institutional and legal improvement of IFAS; multilateral consultations on the development of the UN Special Program for the Aral Sea (UN SPAS) ([December 18](#)); briefing dedicated to the outcomes of the country's chairmanship (December 28). The meeting of ICSD IFAS in Nukus (October 24) reviewed the progress report of ICSD over the pe-

³⁹ The meeting was held within the framework of the regional GIZ program TWRM

⁴⁰ Full text of the Resolution is available on <https://undocs.org/en/A/RES/72/273>

riod of Turkmenistan's chairmanship in ICSD (2015-2019). Finally, the chairmanship of ICSD was passed from Turkmenistan to the Republic of Uzbekistan (see "[ICSD of Central Asia](#)").

Promotion of the national interests and reinforcement of the country's image

Involvement in UN Activity. Speaking at the 74 UNGA (September 28, New York), the Vice-Minister and Minister of Foreign Affairs of Turkmenistan Rashid Meredov voiced the Turkmenistan's approach to the topical issues in Central Asia (see "[General Assembly](#)").

At the 12th and 13th plenary meetings of the ECOSOC Organizational session⁴¹, Turkmenistan was elected to three bodies: Executive Board of the World Food Programme for 2020-2022; Commission on Population and Development for 2020-2024; and, Commission on Narcotic Drugs for 2020-2023 ([May 7](#), New York).

As part of the High-Level Political Forum on sustainable development under the auspices of ECOSOC (July 9-18, New York), Turkmenistan organized a [thematic event "Cooperation of international institutions in providing sustainable development in Central Asia: the UN-IFAS model"](#) (July 17). The participants paid particular attention to the essentiality of strengthening collaboration in resolving the problem of the Aral Sea. In this context, the significance of the upcoming multilateral consultations on determining the future format of the Special UN Programme for the Aral Sea basin (UN SPAS) was underlined. The first VNR of Turkmenistan was launched also at the Forum (July 18).

The [Special UN Programme for the Aral Sea basin \(UN SPAS\) was presented](#) at the side event "Environment and Disasters: Closing the gap in the Asia and the Pacific region" of the 6th session of the ESCAP Committee on Disaster Risk Reduction (August 28-30, Bangkok). The participants acquainted with the main steps planned by Turkmenistan for the preparation of multilateral consultations in the UN – IFAS format and launching the pilot project of the UN SPAS.

Turkmenistan was unanimously elected as a permanent member of the Council of the United Nations Conference on Trade and Development (UNCTAD) during its 66th session ([June 27](#), Geneva).

Turkmenistan also held: a [meeting](#) of the National Leading and Coordinating Committee of the Partnership Framework Development (PFD) Program (February 15); a [meeting](#) with the Sub-

regional Coordinator of FAO (May 9); a [meeting with heads and representatives of the United Nations agencies and specialized institutions](#) accredited in Turkmenistan (July 1); a meeting with the UN Resident Coordinator in Turkmenistan (September 9); and, the [signing ceremony](#) of the joint program with the UN under the title: "Improving the social protection system by introducing inclusive quality social services at the local level" (December 16).

Cooperation with the EU. Cooperation between Turkmenistan and the EU is maintained in such spheres as public governance, private sector development, agriculture, and energy. A meeting took place with the High Representative of the Union for Foreign Affairs and Security Policy Federica Mogherini. Activization of multilateral cooperation between the EU and Turkmenistan, success of the bilateral policy dialogue and the economic and regional integration, and the focus areas of the new EU Strategy for Central Asia were among the issues addressed during the meeting at the MFA. Following the talks, the parties signed the Agreement between the Government of Turkmenistan and the European Union, the European Atomic Energy Community (Euratom) on the establishment, privileges and immunities of the European Union Delegation to Turkmenistan that created a legal base for opening of the EU representative office in the country (July 6). The development of cooperation between the EU and Turkmenistan was also discussed at the meeting with the delegation headed by the European Union Special Representative for Central Asia Peter Burian ([January 31](#), Ashgabat); the 18th meeting of the Joint Committee "Turkmenistan-European Union" ([February 26](#), Brussels); meetings with the EU delegation headed by Christian Berger ([March 4, December 13](#), Ashgabat); in the course of the working visit of the Turkmen delegation to Brussels to continue the dialogue on energy cooperation with the EU ([May 28-30](#), Brussels); and, at the 5th Inter-Parliamentary Meeting of Turkmenistan-EU ([December 2](#), Brussels).

Sources:

The official web-sites of:

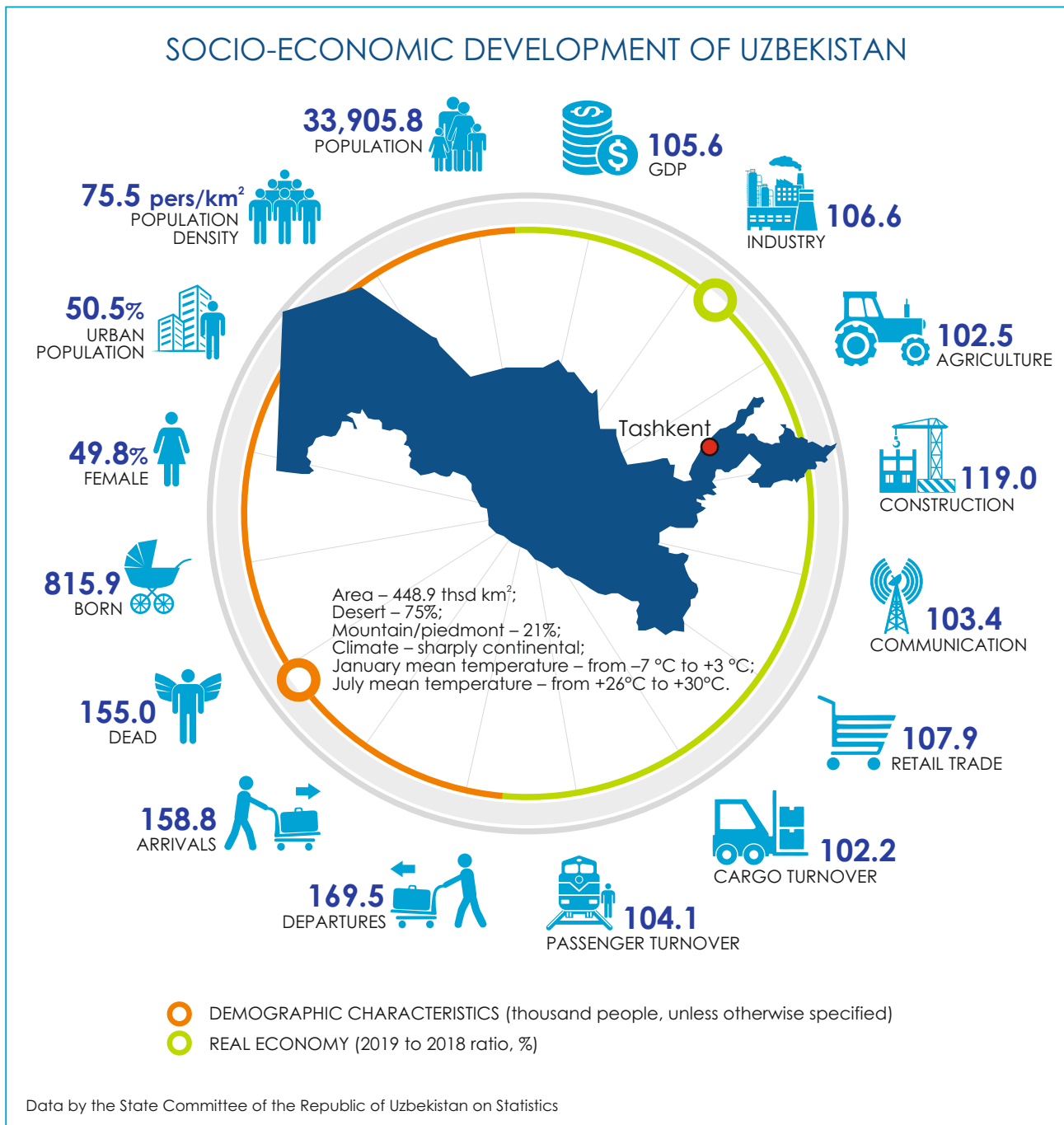
MFA (www.mfa.gov.tm/ru);
Ministry of Justice (<http://minjust.gov.tm/ru>);
Central Bank (<http://www.cbt.tm/ru/index.html>);
EC IFAS (<http://ecifas.gov.tm>)

Information agencies and sites:

<http://tdh.gov.tm/ru/>;
www.turkmenistan.gov.tm/;
<https://turkmenportal.com/>;
<http://orient.tm/ru/>;
www.turkmeninform.com/ru/

⁴¹ Turkmenistan was elected a member of ECOSOC for 2019–2021 at 96th meeting of 72 UNGA (June 13, 2018, New York)

5.5. Uzbekistan



The Economist magazine declared Uzbekistan its 'country of the year' for significant improvements made in the course of 2019.

Water sector

Water resources. The estimated natural fresh and brackish groundwater deposits⁴² potentially yield 27.6 km³/year (75.6 Mm³/day); however, they are unevenly distributed in the country. The demand

of water users is met through a combination of surface water (50.9 km³/year), groundwater (0.5 km³/year), and the reused collector and drainage water (1.6 km³/year).

Over the last years, Uzbekistan's average use of water resources was 51–53 km³/year, of which about 41 km³ (80%) were from transboundary rivers originating in neighboring countries. The water use by sector is as follows: 90% – agriculture;

⁴² Source: Draft Water Sector Development Concept of Uzbekistan for 2020-2030 (www.water.gov.uz/en/posts/1545735855/396)

4.5% – municipal sector; 1.4% – industry; 1.2% – fisheries; 0.5% – thermal power; 1% – other sectors.

The authorized government bodies that deal with

- **water use regulation** are the Ministry of Water Management (MWM) (for surface water) and the State Committee of Geology and Mineral resources (for groundwater); the State Inspectorate for Supervision over Geological Exploration of Subsoil and Safe Operations in Industry, Mining and Public Utilities Sector at the Cabinet of Ministers (for thermal and mineral water);
- **coordination of water accounting, monitoring, ensuring of water quality and safety, and consolidation of the national water balance** is the Ministry of Housing and Communal Services (MHCS) (according to President's decrees issued in 2019).

Latest developments in legislation. The Presidential resolution “On measures for further improvements in the water resources management system” (PP-4486 of 09.10.2019): sets **priorities and key performance indicators of MWM until the end of 2022** and makes amendments in and additions to the Resolution “On measures to Organize Operations of the Ministry of Water Management of the Republic of Uzbekistan” (PP-3672 of 17.04.2018); establishes the Agency for implementation of projects in the field of water resources that will be responsible for development and implementation of projects for the improvement of the national water management system; approves the institutional structure of the Agency and the Roadmap for improvement of water management system efficiency. Among the priorities are the drafting of the Water Sector Development Concept for 2020-2030; the staged adoption of the mechanisms for compensation by water consumers of a share of costs for water services; gradual reduction of the state's share in the total costs of construction, reconstruction and modernization of water infrastructure; expansion of water saving technology to more than 10% of the total irrigated land area, etc.

The Cabinet of Ministers adopted the Resolution “On measures for more effective performance of water consumer associations” that sets priority areas for new WCAs established in districts (one per district) and Kuwasai on the base of existing WUAs. Since January 2020, out of the total amount of loans provided for farm enterprises for growing grain, not less than 1% must be paid for water services delivered by the

associations. In case of cotton-growing farms, this percentage is not less than 2%. The payment of associations' debts for electricity, taxes and other obligatory fees arisen before April 2019, has been postponed to 2022, with the full payment due before 31 December 2024.

Implementation of national strategies and programs in 2019

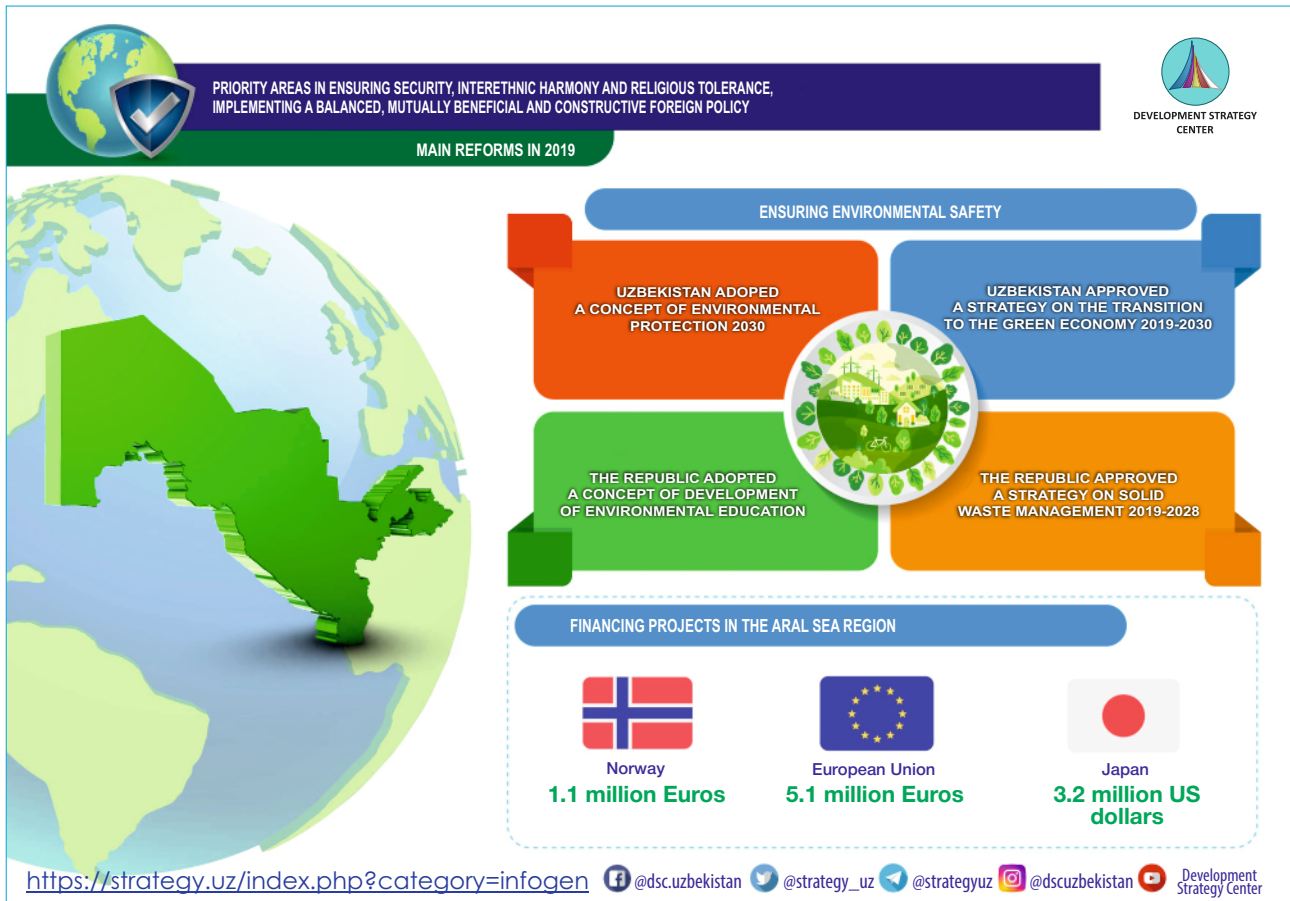
A **State Program was approved** for the implementation of the Action Strategy on Five Development Priorities of the Republic of Uzbekistan for 2017-2021 in the “Year of intensive investments and social development”. The Program provides for implementation of projects, for a total amount of 16.9 trillion soum and \$8.1 billion, aimed at achieving environmental safety and rational use of water and other natural resources. Those include, among others: (1) integral development of cotton, grain and horticulture clusters; (2) setting benchmarks for agricultural land productivity, based on soil fertility, water availability and other factors; (3) improvement of water consumer associations performance through the optimization of WCA quantity, establishment of a united association in the republic, each province and district/city or their re-organization; (4) achievement of rational water use and reclamation of irrigated land through construction and reconstruction of main, inter-district and interfarm collector systems on 821.8 km, subsurface drainage on 341.6 km, canals on 428.8 km, flumes on 127.2 km, and 213 hydrotechnical constructions; (5) development of a national food security program for 2019-2024.

Implementation of the Uzbek President's initiatives and proposals voiced at the XII Summit of the Heads of IFAS Founder-States. As part of the Roadmap adopted in 2018 for implementation of the President's initiatives and proposals, the following work was done in 2019:

- **Developed draft Concept “The Aral Sea Region – a Zone of Environmental Innovations and Technologies”** that was considered at the International High-Level Conference held under the auspices of the UN in Nukus. The work was started for the approval of the Concept by the CA countries and the IFAS Board;

- Organized and held the **International High-Level Conference “Aral Sea Region – a Zone of Environmental Innovations and Technologies”**, which adopted a Roadmap (October 24-25, Nukus). See “[2019 Calendar of Events](#)”;

- **Discussed the draft Regional program of rational water use in CA** during the International Conference in Nukus;



- **Drafted proposals on implementation of measures aimed at institutional and legal improvement of IFAS** and, jointly with CA countries, developed a **package of 34 regional priority projects for inclusion into ASBP-4**;

- Developed a concept of formation and development of the **Central Asian expert platform on water security, sustainable development and future studies** proposed as part organization of cross-disciplinary research, also on the base of scientific and information centers of ICWC and ICSD (See [“Central Asian expert platform on water security, sustainable development and future studies”](#));

- **On the improvement of the Aral Sea and the Aral Sea region**

(1) Facilitated the activities of the UN Multi-Partner Human Security Trust Fund for the Aral Sea region (MPHSTF) (PP-4099 of 08.01.2019 and UP-5848 of 10.10.2019). See [“UN Multi-Partner Human Security Trust Fund for the Aral Sea Region in Uzbekistan”](#))

(2) Launched a [new Joint Program](#) “Building the Resilience of Local Communities Against Health, Environmental and Economic Insecurities in the Aral Sea Region” by UNDP, in cooperation

with the United Nations Population Fund and the Government of Uzbekistan and with the support of the Government of Japan (December 2).

(3) Approved measures for comprehensive socio-economic development in Muynak district, Republic of Karakalpakstan for 2019-2021. 75 projects totaling 26.974 trillion soum are to be implemented under this package. The determined five priority areas for furthering the development of Karakalpakstan include: (1) establishment of large and small enterprises in all industries; (2) creation of conditions favorable for the rapid enlargement of entrepreneurship and support for business; (3) extensive introduction of state-of-the-art technologies in agriculture, augmentation of production volumes, elevation of yields and extension of the range of products; (4) development of a modern infrastructure convenient for the manufacturing industry as much as the wider public; (5) adoption of all-embracing measures to boost living standards ([August 20-21](#), Nukus).

(4) Allocated 100 billion soum for afforestation of the exposed Aral Sea bed. 500,000 ha have been planted. Small water bodies are under construction in the Amu Darya delta. See [“IFAS Agency for Implementation of the Aral Sea Basin and GEF Projects”](#).

(5) Scaled up the activity of the [International Innovation Center for the Aral Sea Basin](#) at the President of the Republic of Uzbekistan. The Center signed 24 Memorandums of Understanding with local and international organizations for joint research efforts. Experimental testing of [synthesized hydrogels](#) for sowing seeds of tomatoes, Bulgarian peppers, pumpkin and other crops was carried out (May); different [varieties of melon](#) from the collection of the Research Institute of Plant Industry were planted in pilot plots adapted to the soil and climatic conditions of the Aral Sea region; an innovative method of [drip irrigation](#) with the use of cotton non-woven sheet to remove accumulating salts was tested; [nursery-blocks with desert plants](#) were formed in the research-production plot “Muy-nak” for their further transportation and planting in the selected areas of the exposed Aral Sea bed (together with representatives of the Japanese OYO Corporation). The Center’s experts took part⁴³ in the [monitoring expedition](#) of the exposed Aral Sea bed (October 20-November 20). The Center also participated in the [“One Million Trees”](#) Campaign by planting 100 junipers in its own territory and assisting in providing seedlings (October 24).

Water management system. A complex water management system has been built in the country to provide water for agriculture and other sectors of the economy.⁴⁴ The total length of the main and inter-farm irrigation network is 28,940 km, the farm and on-farm networks comprise 155,000 km. More than 54,000 hydraulic structures are operated along the main and inter-farm canals; and 114,000 structures are operated in the on-farm network. More than 12,400 wells are used for abstraction of groundwater, including 4,069 wells being operated by the MWM, the other are operated by individual economic entities and population. Also, 56 water reservoirs and 13 mudflow reservoirs (debris basins) are operated in the country to increase water availability, and their total storage capacity is more than 20 billion m³. The total length of drainage network is 142,800 km, of which 106,100 km are open collectors (collecting drains) and 36,700 km are subsurface horizontal drains. For land reclamation purposes, the MWM also operates 172 pumping stations, 3,788 vertical drainage wells and 27,648 observation wells. For irrigation purposes, 1,687 pumping stations are operated in the country and are under responsibility of the Ministry. More than 5,285 pump units consume 8.0 billion kWh annually. Also, more than 10,280

pumping units are operated on the on-farm irrigation networks.

Construction of reservoirs. There are about 60 reservoirs in Uzbekistan. Additionally, new reservoirs with the total capacity of 45 Mm³ at the cost of \$290 million are under construction, particularly in Tashkent (Kyzylsai, about 15 Mm³, area – 1.84 ha, to be completed in 2022), Dzhizak, Kashkadarya, and Samarkand (Bulungur, 100 Mm³, cost – \$19.3 million, to be put into operation in 2021 for irrigation of about 36,000 ha) provinces.

Water saving technologies. Incentives mechanisms are expanded for wider introduction of water saving technologies and **support of those who adopt resource-saving**, particularly, in growing cotton, establishing new vineyards, developing horticulture and building greenhouses. The procedure of subsidizing and the amount of subsidies for compensation of a portion of costs related to introduction of those technologies and a portion of interests of bank loans given for buying and installation of the technologies were determined (PP-4499 of 25.10.2019). Since 2020, state subsidies will be provided in the amount of 8 million soum per hectare for introduction of drip irrigation systems, 4 million soum/ha for sprinkling systems, and 1 million soum/ha for discrete irrigation. Moreover, the legal persons that apply drip irrigation on their land plots will be exempted from the single land tax for a period of 5 years. The targets for **introduction of water saving technologies on 253,381 ha of cropland over 2019-2022** were approved (UP-5742 of 17.06.2019).

Summarizing the year 2019, water saving technologies were introduced on 33,800 ha (drip irrigation), 1,100 ha (sprinkling), and 2,200 ha (discrete irrigation). Agriclusters and farms were subsidized in 2019 in the amount of 84.6 billion soum for introduction of drip irrigation, including 3.6 billion soum for the payment of 10% interest of the loans totaling 88.3 billion soum. As estimated, the application of drip irrigation in cotton growing allowed reducing water inputs by 40-50% on average per hectare, saving fuel by 60%, increasing fertilizer efficiency by 30%, and getting 12-15 days earlier ripening of cotton. Moreover, cotton yield was increased by 20-30 centners.

Projects and programs. The Project “Sustainable Management of Water Resources in Rural Areas in Uzbekistan”⁴⁵ (GIZ/UNDP), Component 1 “National policy framework for water governance

⁴³ Under the Joint Project of the Government of Uzbekistan, UNDP and UNESCO “[Addressing the urgent human insecurities in the Aral Sea region through promoting sustainable rural development](#)”

⁴⁴ Source: Draft Water Sector Development Concept of Uzbekistan for 2020-2030 (<http://www.water.gov.uz/en/posts/1545735855/396>)

⁴⁵ EU Program “Sustainable Management of Water Resources in Rural Areas in Uzbekistan”

and integrated water resources management (IWRM)" helped to (1) install up-to-date water-saving technologies of drip irrigation and sprinkling and weather mini-stations in the pilot plots in six provinces; (2) supply six BISAs with specialized equipment, GUP "Botiometric Markaz" at MWM with measuring equipment for pumping stations and transformers, State Inspectorate "Gosvodkhoz nadzor" with equipment and geo-radar for the geological surveys of dams. The Project Component 2 "Technical capacity building" (1) provided six BISAs with mobile SonTek S5 doppler-proflographs to measure channel profiles, flow velocity and rates in rivers and canals; (2) helped to put into operation a pumping station in Kashkadarya province.

Activities were continued under the National Water Resources Management Project in Uzbekistan (SDC). In particular, training courses were held for the heads of ISAs and main canals from Karakalpakstan and Bukhara, Kashkadarya, Navoyi, Syrdarya and Khorezm provinces (September 23-28).

The Package "[Rehabilitation of Padshaota irrigation infrastructure system](#)" is implemented as part of the [Fergana Valley Water Resources Management Project](#) (WB) in the Namangan province. The Sinohydro Corporation Limited has got contracts for the rehabilitation of the main and inter-farm irrigation canals and their structures (\$7.272 million) and for the construction of new irrigation wells (\$8.367 million).

The Project "[Reconstruction of Main Irrigation Canals of Tashsaka Irrigation System in Khorezm region](#)" was extended until June 1, 2021. The project is implemented through the following ongoing packages: 1-Reconstruction of Tashsaka canal with structures; 2-Construction of cross regulators and outlet structures on main canals; 3-Reconstruction of Shavat and Gazavat canals including structures; 4-Construction of inter-farm canals with structures; 6-Repair and renewal works of structures at main canals of Tashsaka system.

As part of the [South Karakalpakstan Water Resources Management Improvement Project](#) (WB), four packages are implemented: reconstruction of Right Bank canal; reconstruction of Bustan canal (east part); construction of Bustan canal (west part); and, laser leveling and deep loosening of irrigated land.

Assessment of the tender proposal for a contract for construction of a new pump station "Amu Bukhara 1" was completed and the contract was signed with CNTIC (PRC) under the [Amu Bukhara Irrigation System Rehabilitation](#)

[Project](#). The Hebei Construction Group Co.Ltd (PRC) performs activities on the modernization of Kuyu-Mazar and Kizil Tapa pump stations.

Capacity building: open lesson "Issues related to wider application of drip irrigation technology and related solutions" (September 27); master-class on hydrogel technology application for planting trees (November 4-5, Gulistan; November 13-14, Karshi; November 19-20, Termez).

Drinking Water Supply

Latest developments in legislation. Following the Presidential Resolution on the additional measures for the development of drinking water supply and sewage systems in Uzbekistan: (1) the Smart-City Technology Development Concept and related Action Plan for 2019-2021 were approved (PKM 48 of 18.01.2019). One of the focus areas – Smart water supply and sewage disposal – implies the operation of water supply system on the base of online hydraulic models, automated water intakes and water disposal and automatic leakage detection by integrating the systems of distribution, safety and control, the management of storm water and the flood warning system; (2) debates on a resolution on measures for the development and introduction of a single national geoinformation system for water supply and sewage objects and a resolution on the approval of the Concept of Water Supply and Sewage Sector Development in Uzbekistan until 2030.

Following a Presidential decree on the measures for water management improvement in Uzbekistan, the Ministry of Housing and Communal Services (MHCS) prepares a Concept of the water supply and sanitation strategy of Uzbekistan, which includes the establishment of a centralized accounting and monitoring system, the ensuring of safety and quality of waters under the State water fund and the adoption of the "Digital water and sanitation" system.

Problems of drinking water supply. The centralized provision with clean drinking water reaches 68% in the country as a whole, including 52% in Karakalpakstan, 53% in Bukhara province, 54% in Kashkadarya and Surkhandarya provinces, and 56% in Khorezm province. 85% of structures served for drinking water generation and delivery lack measurement systems. Only 44% of water consumers are equipped with water meters. 38% of water mains are in a critical condition, and 20% of pumps are out of service. To reach 98% coverage with water supply in urban area and 85% coverage in rural area and

ensure 31% provision with sanitation by 2030, \$4.5 billion will be needed. In this context, a **set of measures was set**: establish tariffs based on free market demands to attract private investments, adopt a procedure for rate-setting proceeding from full coverage of the service cost and modernization costs, apply public compensation for a portion of drinking water costs borne by population in remote and mountain areas, etc.

Groundwater. Debates on the Cabinet of Ministers resolution "On the approval of the Procedure of state accounting of groundwater and its use" were finished. According to this resolution, since 01.01.2021 it is prohibited to divert groundwater at intake structures that are not equipped with meters.

GP Uzbekgidrogeologiya finishes generation of an interactive hydrogeological map, which includes the following layers: aquifers; stock; resources; current abstraction, and the information on public groundwater monitoring network. Groundwater exploration work is under way. The water sources were approved for supplying with drinking water of about 165,000 people in the settlements in Fergana and Surkhandarya provinces.

Projects and programs. The public-private partnership project "Transfer of water supply and sanitation systems management" is implemented. MHCS, ADB and the Agency for public-private partnership development signed a Memorandum-agreement on the provision of consulting services on contracts for urban water utilities in Uzbekistan to rehabilitate, operate and maintain water supply infrastructure in Samarkand, Bukhara, Namangan and Karshi cities. ADB contributes \$2.6 million.

The Project "Improvement of drinking water supply in Dzhizak province through water resources of the Zarafghan River" is continued. As part of the project, 183 km of water mains and a reservoir with the capacity of 100,000 m³ are constructed, 13 water distribution structures were reconstructed. 52 km of water mains will be rehabilitated in 65 villages.

ADB has approved a loan of \$105.3 million for rehabilitation and expansion of the regional water supply system in Yangiyul and Chinaz districts of Tashkent province as part of the [Second Tashkent Province Water Supply Development Project](#) that will help to provide more than 220,000 people with safe drinking water.

International cooperation. The **OPEC Fund** has approved a loan of \$54 million for a drinking

water supply project for 2020-2025 that is to provide about 200,000 people in 22 settlements in Yangikurgan district and a part of Namangan with drinking water.

EBRD will invest more than \$300 million in modernization of water supply systems in Uzbekistan: (1) project "Modernization of water supply and sanitation system in Namangan province", for reconstruction of 55 km of water mains, modernization of 3 intakes and 10 distribution structures supplying drinking water to the Namangan city and of wastewater treatment structure in Pap district; (2) project "Modernization of water supply and sanitation system in Khorezm province", for construction of new intake structures, modernization of pump stations and treatment structures, and installation of water meters that would help to cover up to 200,000 people with water supply and sanitation services; (3) project "Reconstruction and construction of a sewer system in the Karshi city of Kashkadarya province"; (4) project "Reconstruction and construction of a sewer system in Khorezm province".

Agriculture

The total agricultural land area is 20,236,300 ha, of which: cropland – 3,988,500 ha; perennial plantation area – 383,100 ha; fallow land – 76,000 ha; hayfields and pastures – 11,028,300 ha; and other land area – 4,760,400 ha.

Public administration reforms. The Presidential decree "On measures for the improvement of agricultural sector governance system" (UP-5708 of 17.04.2019) sets the main tasks of the Ministry of Agriculture. A number of organizations, including the Scientific-Production Center for Agriculture and Food and its research units, the Tashkent State Agrarian University and its branches were placed under the authority of the Ministry. In line with the Presidential resolution "On the improvement of the Ministry of Agriculture of the Republic of Uzbekistan" (PP-4292 of 17.04.2019), new divisions were formed at the Ministry for the development of agricultural entrepreneurship, agri-clusters, economic associations and public-private partnerships, for financial relations and services in the agricultural sector, efficient land use, etc. Additionally, agricultural extension centers will be established at the Tashkent State Agrarian University and its branches for training, including training of trainers.

Latest developments in legislation. Gradual measures are taken for reformation of the agricultural sector and introduction of market mechanisms. In particular, the following documents were appro-

ved: (1) **National agricultural development strategy for 2020-2030** and its Roadmap; (2) **Concept for efficient water and land use in agriculture**, its Roadmap and targets on agricultural land use efficiency over 2020-2030. Within the framework of the Concept, non-used irrigated land, rainfed land and forest fund land, pastures, fallow land, perennial plantation land and other kinds of land are allocated to agricultural enterprises and citizens of Uzbekistan for up to 50 years.

New mechanisms started to be introduced for the development of clusters and cooperation system in horticultural and viticultural production, processing and export. Measures are set for the development of agricultural cooperation forms in horticulture (PP-4239 of 14.03.2019). As an experiment, in 2019-2020 it is planned to organize agricultural associations for joint production, storage and sale of fruit and vegetable products in 8 districts in Dzhizak, Samarkand, Fergana and Tashkent provinces. Based on the experiment's results and international best practices, a draft law on agricultural cooperation is to be prepared by December 1, 2020.

A resolution "On additional measures for furthering of horticulture and viticulture and creating value added" (PP-4549 of 11.12.2019) sets the procedure for establishment of horticultural clusters and plans full-scale inventory of orchards and vineyards in 55 districts to identify ineffective orchards and vineyards for improvement.

Additional measures were determined for **ultra-processing and furthering of food industry** (PP-4406 of 29.07.2019). In particular, in 2019-2020 it is envisaged to establish 8 large agri-logistical centers, with planned output of 3 million tons, in several provinces of Uzbekistan through foreign credits in the amount of \$367 million and establish 37 centers (output – 360,000 tons) in Karakalpakstan and provinces through national investments. This will help to form an up-to-date infrastructure ensuring stable seasonal prices at the local market, food security and high-quality products.

For the **development of the livestock-breeding sector**, the resolution "On measures for further development and support of the livestock-breeding sector" provides for the allocation of reserve rainfed land and pastures to livestock farms and fodder producers, with the obligation to grow fodder and apply drip and sprinkling irrigation there.

The adopted **Law on Pastures** (ZRU-538 of 20.05.2019) regulates relations in pasture use and protection.

Farm development. By January 2020, the number of individual farms reached 92,600 in the Republic. Large-scale work was done to establish farms of multisectoral specialization. As a result, 11,939 multisectoral farms were supported in organization of intensive orchards, vine plantations, greenhouse construction, processing, and services.

Agricultural equipment. By the beginning of 2019, only 74% of equipment needs have been met in the agricultural sector through locally manufactured and imported equipment. More than 85% of agricultural equipment is deteriorated or outdated. The average level of agricultural mechanization is 88% in cotton and grain growing, 48% in livestock breeding, 42% in vegetable production and 26% in horticulture. The sector highly depends on import. In this context, for further development of the agricultural machinery branch and local manufacturing, a number of documents were prepared: (1) a resolution "On additional measures for timely equipping of the agricultural sector" that envisages state financial support for the provision of farmers with quality agricultural equipment; (2) the "Concept for further development of agricultural equipment branch of the Republic of Uzbekistan for the period until 2025"; (3) a resolution "On state support measures for agricultural mechanization", which sets the procedure of subsidizing procurements of agricultural equipment manufactured locally; and (4) a resolution that approves the Action plan for implementation of investment projects to extend local production of agricultural equipment by 2021 and the Program of measures for the development of agricultural equipment production over 2019-2020.

Projects and programs. ADB provided loans in the amount of (1) \$150 million for livestock breeding development as part of the Livestock Value Chain Development Project (2020-2024, \$237.45 million); (2) \$197 million for the establishment of agri-industrial centers for processing, sorting, packaging, storage and delivery of fresh and processed fruits and vegetables in Andizhan, Samarkand and Tashkent provinces as part of the Horticulture Value Chain Development Project (2019-2023, \$244.75 million). WB provided as credits (1) \$100 million for infrastructural improvement of 300 villages under the "Prosperous village" project; (2) \$200 million for the expansion of micro-, small and medium enterprises under the Fergana Valley Rural Enterprise Development Project.

The **International Islamic Trade Finance Corporation** allocates \$50 million for cotton produc-

tion and processing through the project “Covering the costs of growing cotton and financing the final reports”.

UNDP is implementing together with (1) **GEF** the project “[Reducing pressures on natural resources from competing land use in non-irrigated arid mountain, semi-desert and desert landscapes of Uzbekistan](#)” in three pilot plots – two plots in Zaamin district of Dzhizak province and one plot in Karakul district of Bukhara province. As part of the project, rotation-based cattle grazing plans were drafted to account for yield, capacity and types of flora on pastures. Two water pipes were provided for the Zaamin forestland for drip irrigation of rosehip plantations. Walnut and Turkish “Izmit” poplar plantations were organized in foothills and mountain areas of Zaamin district. Black saxaul was planted in spring 2019 in the Karakul forestland. And with (2) the **Adaptation Fund** the project “[Developing climate resilience of farming communities in the drought prone parts of Uzbekistan](#)” in a number of districts of Karakalpakstan to establish climate-resilient agricultural and pastoral production systems.

EU and **GIZ** implement the project “Sustainable development in rural areas of Uzbekistan”, which aims to further develop social and economic potential of rural areas in Uzbekistan by transferring European Union best practices (know-how) and technologies on agro-food value chains in partnership with local authorities and economic actors (project site: <http://uzru.raldev.eu/ru>).

International cooperation. Russia and Uzbekistan approved a Roadmap for broadening of agricultural cooperation in the mid-term (May 30, Urgench). In particular, the Russian group “PhosAgro” and the Government of Uzbekistan discussed the prospective cooperation for meeting the demands of Uzbek agriculture for high-quality and environmentally friendly phosphorous fertilizers and their effective application.

An agreement was reached with **Japan** on exporting 28 types of agricultural products (June), a number of documents was signed with **PRC** on cooperation in the agrarian field (July), and the aspects of deepening the trade-economic cooperation between the **EU** and Uzbekistan, including in the agricultural sector, were discussed (November).

Agreements were signed with (1) the OneSoil company (Republic of Belarus) and Boston Consulting Group⁴⁶ on the use of satellite data in Uzbekistan’s agriculture. This includes the work on intensive digitization of agriculture as part of the Smart Agriculture Concept and unbiased land and crop mapping in Uzbekistan by using modern technologies; (2) the “Belsemena” of the Republic of Belarus on the development of public-private partnerships for seed production; (3) the Ministry of Agriculture of the Republic of Kazakhstan (the Roadmap) for more intensive cooperation between the two countries in agricultural science, production, certification, digitization, trade, veterinary and livestock breeding, and plant quarantine for a period of 2019-2024.

Capacity building. In line with a Cabinet of Ministers’ resolution, the Khorezm branch of rice research institute will be established on the base of the Khorezm research-experimental station for deepening of research on new high-yielding and disease-resistant rice varieties and hybrids that fit for soil and climatic conditions in the region.

The following trainings were held: training workshop “Developing cooperation in agriculture” aimed to raise awareness of local administrations and farmers about the advantages of joint management (March 18-20); [regional training](#) of trainers organized by FAO to strengthen agricultural extension and advisory services (April); a workshop “Agrochemical studies of soil and agrochemical mapping of irrigated land” (September 26).

Events: (1) the International conference “Agricultural transformations, food security and nutrition in Central Asia”, which launched the IFPRI Global Food Policy Report 2019⁴⁷ (May 31, Tashkent); (2) a [multilateral forum](#) on “Transition from agricultural and environmental problems to opportunities to attract investment and innovation in the Aral Sea Basin”, during which a Memorandum was signed between the Uzbekistan Ministry of Agriculture and the International Center for Biosaline Agriculture (ICBA) (August 8-9, Tashkent); (3) the Conference “Analyzing cooperation and prospects of agricultural production and processing and developing a legal framework for regulation of related relations in Uzbekistan” (August 15, Tashkent); (4) International scientific-practical conference “Innovative approaches to the use of agrobiodiversity for sustainable agriculture” (September 25).

⁴⁶ International company specialized in management consulting and a leading consultant on business strategies (<https://www.bcg.com/>)

⁴⁷ IFPRI Global Food Policy Report 2019 (<http://gfpri.ifpri.info/>)

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 (1%) – isolated stations. The main source of energy generation is 11 thermal plants, including 3 cogeneration plants. The capacity of modern energy-efficient blocks is 2,825 MW (25.6% of the total capacity of TPP). In 2019, TPP generated 89.6% of local energy in the republic.

The hydropower sector includes 42 HPPs, including 12 large ones, with the total capacity of 1,680 MW (90.8% of the overall HPP capacity), 28 small HPPs of 250 MW in total (13.5%) and 2 micro plants of 0.5 MW. 30 HPPs with the total capacity of 532 MW (4 large plants – 317 MW and 26 small plants – 215 MW) are located along watercourses. 10 HPPs are a part of reservoir systems and have the total generating capacity of 1,400 MW. The hydropower use coefficient is 27% in Uzbekistan.

Public administration reforms. In line with the Presidential decree “On measures for radical improvement of the national fuel-energy management system”, the [Ministry of Energy](#) was established (UP-5646 of 01.02.2019). The Ministry included in its structure also the Agency for Atomic Energy Development, the Inspectorate for Oil and Gas Use and the Electric Energy Inspectorate.

Measures were taken to improve the governance system of the JSC “UzbekHydroenergo” through the adoption of modern methods of corporate management and meeting of sectors and population demand for electricity by attracting foreign investments. Debates on the National Hydropower Development Concept for 2020-2024 were completed. According to the Concept, it is planned to build 4 HPPs of more than 30 MW and 16 new smaller ones and modernize 21 existing plants. As a result of the implementation of the Concept, it is expected to increase the annual energy generation by 2.826 billion kWh, with the total generation of 9.343 billion kWh at 57 HPPs.

Hydropower. Following the resolutions “On the program of measures for further development of hydropower over 2017-2021” and “On measures for implementation of the national investment program in 2019”, the following activities were undertaken in 2019:

New hydropower construction projects. New HPPs were put into operation, including Tuy-

buguz small HPP (Tashkent province) at the capacity of 12 MW and the average annual generation of 41.8 million kWh; the cascade of two small hydropower plants (in the territory of Big Fergana Canal, Namangan province) at the capacity of 12 MW and the average annual generation of 72.89 million kWh. Several HPPs are under construction, including Pskem HPP (design capacity – 400 MW; average annual generation – 958.5 million kWh) on the Pskem River and Nizhnechatkal HPP (4 hydroaggregates of 19 MW each) on the Chatkal River in Bostanlyk district.

Small HPP is under construction at the Sardoba reservoir in Syrdarya province. It is planned to install two hydroaggregates of 5.35 MW each and the annual production capacity is expected to be 41.1 million kWh. The project contractor is the “Siloviye mashiny” company (Russian Federation).

Hydropower modernization projects. The modernization of HPP “SFC-1” (\$5.81 million, of which \$4.37 million – contribution from the WB and \$1.09 million – funds of AKB “Uzsanoatkurilish”) at the Shakhrikhan hydropower cascade was completed. The capacity of HPP reaches 2.2 MW, while the annual average production capacity is 17.1 million kWh.

As a result of modernization of Farkhad HPP, the installed capacity will increase from 126 to 127 MW and the deteriorated and outdated equipment will be replaced.

The resolution “On measures for implementation of an investment project on “Improving safety of Charvak HPP” approved the project’s feasibility study (PKM-706 of 22.08.2019). The project was included into the Program of cooperation between Uzbekistan and the French Development Agency for financing of a €13 million loan from the Agency over 2018-2021.

A list of natural and artificial watercourses was determined for the construction of 19 generating plants at the design capacity of 10,050 kW for a total amount of \$12 million. One of projects at \$322,000 has been implemented: micro-HPP (capacity – 200 kW; annual generation – 1.5 million kWh) on a diverting canal of Zaamin reservoir in Dzhezak province.

Thermal power. Based on the Program of Large Investment Projects in the Energy Sector for 2019-2030, 15,600 MW of new and modernized generating capacities are to be added by 2030 in thermal power only. At the same time, it is planned to withdraw 6,400 MW of outdated generating capacities of TPP.

Atomic energy. The following documents were approved in this sphere in 2019: the Concept of atomic energy development in the Republic for 2019-2029 and the related Roadmap; the Capacity building strategy for the national nuclear energy program; and, the law “On peaceful uses of atomic energy”. The International Atomic Energy Agency has approved four projects for over €1 million to be implemented in 2020-2021. The Russian Atomic Agency (Rosatom) has registered its country office in Uzbekistan.

Alternative energy sources. The law “On the use of renewable energy sources” determines the focus areas of the RES policy, state support and incentives. In particular, RES-based producers, including in the private sector, are exempted from property (RES installations) and land (occupied by the installations) taxes for 10 years. Incentives are also to be given to those who use RES in dwellings.

A presidential decree sets the target to increase the share of RES to 25% by 2030 (PP-4422 of 22.08.2019). Currently, the share of RES, mainly in the form of hydropower, has accounted for 10% only in the total national energy generation.

For diversification of generation structure, measures are taken to implement investment projects in RES on the basis of public-private partnerships. Uzbekistan has joined the WB [Scaling Solar](#)⁴⁸ program. As part of the program, the Masdar company (UAE) was selected for implementation of an investment project of the photoelectric station of 100 MW in Navoiy province at a rate of \$0.02679 per kilowatt-hour and the construction period of 12 months. The station is to be commenced in Quarter 1 2021. Another photoelectric station of 100 MW is to be constructed in Samarkand province by French company «TOTAL Eren».

Construction of a small pilot solar station was started by German company “Graess Energy” in Muynak.

Wind power is also developed in the Republic: an Agreement was signed with the Masdar company (UAE) for the construction of a wind power plant of 400 MW in Navoiy province (January 18) at the total investment cost of \$600 million; another plant of 1,500 MW is under construction in Bukhara province by the Liaoning Lide corporation (PRC).

International cooperation. The Ministry of Energy (1) signed with USAID a Memorandum of Understanding as part of projects on the improvement of energy efficiency and the use of renewables; (2) started cooperating with the Finnish company “KaukoInternational” to promote investments and adopt sustainable, reliable and affordable technologies of geothermal energy production and operation; (3) agreed with the “Assystem Engineering and Operation Services S.A.S.” (France) to establish a joint venture for designing all types of grids and energy structures by using innovation technologies (September 24); (4) signed a “take-or-pay” contract for energy supply from Uzbekistan to Afghanistan for 10 years (20-21 September).

JSC “UzbekHydroenergo” signed (1) a Memorandum of Cooperation with General Electric (USA) and Grupo Cobra (Spain) for the adoption of modern technologies in hydropower construction and modernization; (2) a Cooperation agreement with PAO “Siloviye mashiny”.

During the 5th meeting of the Sub-committee on energy cooperation of the Uzbek-Chinese Intergovernmental Cooperation Committee, the parties agreed to study feasibility of an environmentally-friendly project on energy generation through household waste combustion in Namangan province (August 26).

Capacity building. Among others, the following training workshops were held in: introducing the international ISO 50001 standard (September 21); increasing reliability of hydrotechnical constructions for maximum use of hydropower capacities (September 25). A branch subdepartment of the TIAME on the Use of Water Energy and Pump Stations was opened in the office of the cascade of Chirchik HPPs.

Events: 1) International exhibition and conference “Power Uzbekistan 2019”, where memorandums of understanding were signed with the World Nuclear University of the World Nuclear Association and the Atomic Energy Association of Japan (May 15-17); (2) International Forum of Energy Reforms (July 18); (3) Energy Week of Uzbekistan (September 25-27); (4) Conference of investors in renewables and energy infrastructure – [RENPOWER Uzbekistan 2019](#) (December 4).

⁴⁸ Scaling Solar brings together a suite of World Bank Group services under a single engagement aimed at creating viable markets for solar power in each client country (www.scalingsolar.org/)

Environment and Climate Change

Latest developments in legislation

The following documents were approved in 2019:

- a Roadmap for establishing the system of national nature protected areas over 2019-2022. It provides for the establishment of the state nature reserve "South Ustyurt" and a number of state reservations, including the Sudoche lake system, in Karakalpakstan. The Central Authority for Biodiversity and Nature Protected Areas is to be formed at Goskomecologiya;

- Regulations on establishing the water body buffer zones and sanitary protection zones in Uzbekistan that set the procedure and the regime of economic activities in these zones;

- Environmental Education Concept, which is aimed at building environmental knowledge, awareness and culture among young generation and improving the ecological science by mobilizing innovative technologies;

- Regulation on voluntary eco-labeling in Uzbekistan. An eco-label identifies products, production, use, transportation, storage and utilization of which proves to have a minimal negative impact on natural environment, health and bio-resources. Producers may label their products as environmentally safe on voluntary basis after getting the respective certificate;

- (1) "Strategy of biodiversity conservation in Uzbekistan over 2019-2028" and related Action Plan. Particularly, it is envisaged to extend the nature protected areas to 12% of the country area, expand afforested areas on the exposed Aral Sea bed to 1.2 Mha, establish a single information database of state biodiversity monitoring and inventory, etc.;

- "Strategy of transition to green economy in Uzbekistan for 2019-2030", which is aimed at integration of climate change into the sustainable national economy development. The Strategy priority areas include, among others: (1) increase of energy efficiency in main economic sectors; (2) energy diversification and RES development; (3) climate change adaptation and mitigation, improvement of resource use efficiency and conservation of ecosystems; (4) development of financial and non-financial support mechanisms for green economy;

- Environmental Concept of Uzbekistan until 2030, which sets priority areas of public environmental policy, and related Roadmap. In par-

ticular, it envisages measures for (1) mitigation of the Aral catastrophe consequences; (2) protection of land, water and biological resources; (4) improvement of waste management; (5) greening of economy, etc.;

- Strategy of solid waste management for 2019-2028, which provides for the development of legal and economic framework for compensation of waste management costs by producers themselves;

- Regulations on environmental monitoring in Uzbekistan to improve the monitoring system in the republic, ensure regular observations over natural resource use, and improve information support of public environmental control.

The decree "On measures for more efficient combatting desertification and drought in Uzbekistan" assigns to the State Forestry Committee additional functions related to prevention of desertification, afforestation, implementation of republic's international commitments to combat desertification and drought.

International cooperation. The Goskomecologiya signed: (1) a Memorandum with the Italian Ministry of Environment, Land and Sea Resources; (2) an environmental cooperation agreement with the Belarusian Ministry of Natural Resources and Environment; (3) a Memorandum of cooperation with "Alpha Global Capital (S) Pte. Ltd." (Singapore) on implementation of plasma technology for waste utilization (August 27).

Capacity building. The following capacity building events were held: a seminar on innovation development and promotion in the area of air safety (January 31); a roundtable on the adoption of world waste management practices in the Republic of Uzbekistan (July 11); a seminar "Globalization of environmental problems" (July 22); a seminar "National environmental impact assessment systems and the requirements of the Espoo Convention and the Protocol on strategic environmental assessment" (August 19-20).

Events: (1) [Hashar Week](#) to attract the general public to the issues of pollution, ecology and waste sorting. During the week, different events took place in four areas: Action, Education, Arts, and Business (March 11-17); (2) Scientific-Practical Conference "Importance of biodiversity conservation in Uzbekistan" (May 21); (3) a Conference dedicated to the World Environment Day (June 4); (4) 2nd Central Asian International Exhibition and Business-Forum "Green technologies, environmental protection and recycling –

GET Central Asia 2019" (October 9-10); (5) an International Press-club meeting, where the national Environmental Concept 2030 was discussed (November 20); (6) first International ecological marathon "ARAL MARATHON" under the slogan – We are responsible for the future! (October 17-22, Tashkent – Samarkand – Bukhara – Urgench – Nukus – Muynak); and, presentation of the fifth edition of the Red Book of Uzbekistan.

In October 2019, a five-year campaign "Plant million trees" was started in Nukus.

Ongoing projects. As part of the project "[Sustainable natural resource and forest management in key mountainous areas important for globally](#)

[significant biodiversity](#)" (UNDP, GEF), an innovative biodiversity conservation information management system and a publicly accessible Internet portal – Information Center on Biodiversity of Uzbekistan (ICBU) were developed (<http://bcims.uznature.uz/wordpress/>). A SMART⁴⁹ patrolling program was introduced. The SMART is tested in Gissar and Chatkal nature reserves. Seven tree nurseries were established in the two snow leopard landscapes – Western Tien Shan and Pamir-Alai – for forest regeneration.

A regional seminar was held within the framework of the project "[Central Asian Desert Initiative](#)" (CADI)⁵⁰ aimed at preserving biological diversity and the conservation and sustain-



nable use of cold winter deserts in Central Asia. An agreement was reached to open the interim CADI regional secretariat in Tashkent (October 22–23).

The UNDP-GEF Project "Complete HCFC Phase-out in Uzbekistan through promotion of zero ODS low GWP energy efficient technologies" started to be implemented in Uzbekistan in 2019.

SDG in Uzbekistan

Uzbekistan is in the list of countries that develop Voluntary National Reviews (VNR) on **SDG**. SDGs are closely related with the Action Strategy of Uz-

bekistan for 2017-2021 (totally 81 indicators harmonized with the National sustainable development goals).

The Coordination Council for National sustainable development goals and objectives approved 206 indicators for monitoring (March 20). A special national web-site was developed (nsdg.stat.uz). The VNR is to be presented in 2020 at the High-Level Political Forum on Sustainable Development.

The following events were organized on SDG: a roundtable "Urbanization concept 2030 and National sustainable development goals" (April 17); a seminar "Financing SDG" (May 14);

⁴⁹ Spatial Monitoring and Reporting Tool

⁵⁰ The project as a part of the International Climate Initiative (IKI) is implemented jointly with the University of Greifswald, Michael Succow Foundation (Germany) and the FAO Sub-regional Office for Central Asia. The main CADI target countries are Kazakhstan, Turkmenistan, and Uzbekistan



the UNDP/UNECE/UNEP/UNU/FAO joint workshop on SDG indicators on environment and economic well-being (June 12-14); a seminar “Introducing the sustainable development indicators: building state capacity on human rights and implementation of the 2030 Agenda in Uzbekistan” (June 26-27); the [Regional Conference](#) “Production Potential, Commerce and Sustainable Development Goals (SDGs) in Central Asia” (November 25).

Emergencies

Reed fire in the Sudoche Lake system in Muynak district of Karakalpakstan occurred on the 4th of July. The fire was caused by lighting. The total area of fire extended to 278 ha, of which 111.2 ha belong to the Muynak aquaculture industry, and 166.8 ha, to the Sudoche ornithological nature reserve⁵¹. The fire stopped on the 6th of July. No dead animals or birds were recorded. The damage from the fire was estimated at more than 225 million soum.

Foreign Policy and International Cooperation

In 2019, the President of Uzbekistan paid formal and working visits to India (January), Germany (January), UAE (March), China (April), Turkmenistan (October), Belarus (July-August), Azerbaijan (October), Japan (December), and Russia (December).

The country was visited by the Heads of CA States, Korea, Germany, the European Union and the Heads of SCO member-countries.

Key developments in the foreign policy of Uzbekistan in 2019

The draft Concept for strengthening the positive image of Uzbekistan in the world has been developed.

Development of alliances and strategic partnerships. The country further builds relationships with Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan to strengthen regional trade and economic cooperation, develop the regional transport-transit infrastructure, ensure rational and integrated use of water and energy resources along transboundary rivers in CA and achieve environmental sustainability in the region, finish delimitation and demarcation processes, enhance friendly and good-neighborliness relations, and develop scientific-technological and cultural cooperation.

The [Second Consultative Meeting of Central Asian Leaders](#) took place in Tashkent. The meeting was attended by President Gurbanguly Berdimukhamedov of Turkmenistan, President Emomali Rahmon of Tajikistan, President Soronbay Jeenbekov of Kyrgyzstan and former President, now, Elbasy (Leader of the Nation) of

⁵¹ Sudoche is the habitat of muskrat, ducks, goose, owl, pelican, gull, flamingo, etc.

Kazakhstan, Nursultan Nazarbayev. The presidents addressed a range of matters, including the enhancement of regional security, removal of trade barriers, promotion of large-scale projects to modernize infrastructure and extend transboundary options. The leaders affirmed the common interest in achieving stability and sustainable development, good neighborly relations, security and well-being in the region. The issues of climate change, renewable energy sources were also in the focus of the discussions and the pressing need for comprehensive measures to tackle desertification and water issues was stressed (November 29).

Russia takes a leading position as a foreign trade partner of Uzbekistan. A Memorandum of Cooperation was signed between Rosstrudnichestvo and the Committee for International and Friendly Relations of Uzbekistan. The X Asian Conference of the Valdai International Discussions Club was held on “Central Asia and Eurasia: Multilateral Cooperation to Face the Challenges of Global Disorder.” A cooperation agreement was signed between the Institute of Strategic and Interregional Studies of Uzbekistan and the Valdai International Discussions Club Development and Support Fund (November 10-11).

Participation in international organizations

In 2019, Uzbekistan became (1) a member of the Global Green Growth Institute; (2) a member of the Cooperation Council of Turkic Speaking States (September 14). The President of Uzbekistan took part in the 7th Council summit (October 15, Baku). The CIS chairmanship was transferred to Uzbekistan (from January to December 31, 2020) according to the decision of the Ashkhabad Summit. At the 70th Meeting of the International Commission on Irrigation and Drainage the Minister of Water Management of Uzbekistan Sh. Khamraev was elected an ICID Vice-president for the period of 2019-2022 (September 1-7, Bali, Indonesia).

Promotion of the national interests and reinforcement of the country's image. Uzbekistan together with the UN mission in Uzbekistan hosted the International High-Level Conference “Aral Sea Region – a Zone of Environmental Innovations and Technologies” (see Section “[2019 Calendar of Events](#)”). UN GA at its plenary session adopted a special resolution “Sustainable tourism and sustainable development in CA”, which was first put forward by the President of Uzbekistan. The draft document was supported by more than 50 countries. UNESCO included Tashkent into the Global Network of Learning Cities.

The following events were also held in 2019: (1) 6th EU-CA High-Level Conference on Environmental and Water Cooperation (January 24-25); (2) International Conference “Central Asian Connectivity: Challenges and New Opportunities” (February 19-20); (3) Central Asian Economic Forum (March 15); (4) Central Asia Climate Change Conference (April 3-4) (see Section “[2019 Calendar of Events](#)”); (5) First Dialogue of Energy Ministers of CAREC member-countries (September 20); (6) Central Asian Energy Investment Forum 2019.

“...We consider it expedient to use capabilities of the International Fund for Saving Aral Sea and the resources of the Multi-Partner Human Security Trust Fund for the Aral Sea region, established under auspices of the United Nations, to tackle practical tasks in terms of drawing new knowledge and innovative technologies to the region, introducing principles of «green» economy, preventing further desertification, ecological migration and other measures...”.

The leaders adopted a joint statement and agreed to hold the next meeting in Kyrgyzstan in 2020.

A new mechanism of extended **regional cooperation between India and Central Asia** was launched. Samarkand hosted the first Dialogue “India-Central Asia”, where the foreign ministers discussed the possibilities of extending relations between India and the Central Asian countries in bi- and multilateral formats (January 12-13). The delegation from Afghanistan took part in a plenary session of the Dialogue. The next ministerial meeting is to take place in India in 2020.

Cooperation with **Afghanistan** has been enhanced. The Uzbek-Afghan business forum took place in the B2B format (July 15); a specialized Uzbek-Afghan trade exhibition was organized (July 16); a meeting of the Intergovernmental Commission on Trade and Economic Cooperation between Uzbekistan and Afghanistan was held and resulted in signature of agreements in the area of energy, processing industry, agriculture, transport and oil and gas sector (July 17).

Sources:

Official sites of the:

President (<https://president.uz/ru/>);
Legislative chamber of Oliy Majlis
(<http://parliament.gov.uz/ru/>);
MFA (<https://mfa.uz/ru/>);
Ministry of Investment and Foreign Trade
(<https://mift.uz/ru/>);
Ministry of Water Management
(<http://www.water.gov.uz/ru/>);
Ministry of Energy (<https://minenergy.uz/ru/>);
Goskomecologiya (<http://eco.gov.uz/ru/>);
Ministry of Agriculture (<http://www.agro.uz/ru/>);
National law database (<https://www.lex.uz/>)

Information agencies and sites:

www.uzdaily.uz/;
<http://ca-news.org/>;
<http://ru.sputniknews-uz.com/>;
<http://podrobno.uz/>;
www.gazeta.uz/;
www.uza.uz/ru/;
<https://darakchi.uz/ru/>;
<https://nuz.uz/>;
<http://xs.uz/ru/>





Section 6

United Nations
and its Specialized
Agencies

6.1. General Assembly



74th Session
United Nations
General Assembly

The 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.

On 17 September, the 74th Session of GA was opened, with agenda containing 174 items.

The President of the Republic of Kazakhstan, Prime Minister of the Republic of Tajikistan, the Ministers of Foreign Affairs of Kyrgyzstan and Turkmenistan spoke at the [general debate](#) "Galvanizing multilateral efforts for poverty eradication, quality education, climate action and inclusion" (24-30 September). Among other things, they focused on water, climate change, SDGs, and energy-related issues.

Statements by representatives of Central Asian countries at the general debate of the 74th Session of the UNGA

Address by the President of the Republic of Kazakhstan



Galvanizing multilateral efforts for poverty eradication, quality education, climate action and inclusion

A nuclear-weapon-free world, preventive diplomacy, combating terrorism, enhanced regional cooperation, economic development and democracy. This is an incomplete list of priorities of the Government of Kazakhstan. Those were mentioned by Mr. Kassym-Jomart Tokayev, President of the Republic of Kazakhstan from the rostrum of the UNGA.

The alarming new global reality is influenced by the following major trends: (1) growing number of unresolved conflicts and tensions in various parts of the world; (2) lack of trust among global

and regional actors; (3) distortion of the existing world economic landscape due to widening inequalities and emerging global debt crisis; (4) environmental degradation. "In that complex environment, Kazakhstan firmly pursues a policy of inclusive and sustainable development, comprehensive dialogue and peaceful endeavors".

International projects. Kazakhstan is at the forefront of the global movement to eliminate nuclear weapons; that stems from the firm conviction that nuclear weapons are no longer an asset but a danger to global peace and stability. Kazakhstan contributes to United Nations peacekeeping by co-deploying with Indian partners a 120-strong unit to the United Nations Interim Force in Lebanon, as well as by providing military observers. Kazakhstan provides a platform for inter-Syrian negotiations. Thirteen such rounds have taken place in our capital. Thanks to the Astana process, which complements the Geneva talks, a cessation of hostilities has been reached. As a counter-terrorism measure, Kazakhstan initiated the code of conduct towards achieving a world free of terrorism by the United Nations centenary in 2045, and we urge others to join it.

The growing role of Central Asia. "For decades, the Central Asian States had weak economic ties, which impeded their sustainable growth. Now, by sharing common interests and chal-

lenges, our region has entered the next stage of its development. [...] New opportunities have emerged for the region following the first informal consultations at the highest level held in our capital last year. [...] I am fully convinced that Central Asia is becoming a global stakeholder. [...] The situation in Afghanistan has a direct impact on our region. We hope that the Afghan-owned and Afghan-led peace process, assisted by all key stakeholders, will produce lasting peace and prosperity for this country. [...]"

Sustainable Development Goals. "We pay special attention to the full implementation of the 2030 Agenda as we strive to avoid the notorious middle-income country trap. SDGs are integrated by 80% into our strategic Government programs. This May, I opened a new building for international organizations in Kazakhstan; it hosts 16 UN agencies. As the next step, we propose to establish on its premises a UN Centre for SDGs with the mandate of assisting Afghanistan and countries in Central Asia. [...]"

Transformations in Kazakhstan. "We shall continue to work towards the comprehensive transformation of our society under the motto "Continuity, justice, progress". [...] My formula for Kazakhstan's political system is one of a strong and visionary president, an influential Parliament and accountable Government. [...] As the new President, I am committed first and foremost to building a modern welfare State. [...] As part of my agenda, I launched the National Council of Public Confidence to promote meaningful dialogue between Government and society. My vision is based on the concept of different opinions, but one nation".

Environmental degradation. "Environmental degradation has become one of the most destabilizing factors globally. The impact of climate change in Central Asia in particular will result in dramatic existential challenges, such as desertification, the melting of glaciers and the subsequent depletion of drinking and irrigation water".

Full text in English: <https://undocs.org/en/A/74/PV.4>

Address by the Minister of Foreign Affairs of the Kyrgyz Republic

The Central Asian region has experienced the accelerated melting of glaciers, which for centuries have been a source of life and clean drinking water. That will have an impact on vast areas, changing the landscape, and may affect traditional ways of life and lead to mass displacements. This was highlighted by Mr. Chingiz Aidarbekov, Kyrgyz Minister of Foreign Affairs from the rostrum of the UNGA.

Sustainable Development Goals. "The Kyrgyz Republic prioritizes achieving SDGs. The Goals have been successfully implemented as part of the national development strategy for the period from 2018 to 2040, which seeks to further promote economic development and will help us to effectively implement the SDGs. As further proof of our commitment to the 2030 Agenda, the Kyrgyz Republic has requested to submit in 2020 its voluntary national review on SDG implementation as part of the High-level Political Forum on Sustainable Development. At the international level, the Kyrgyz Republic is also contributing to the implementation of the SDGs. We hosted the World Nomad Games, aimed at preserving the diversity of cultures and traditions, which has been recognized and supported by the General Assembly and UNESCO. We are grateful to the United Nations for including the Kyrgyz Republic in the financing for development project".



Climate change impact. "As a mountainous country, the Kyrgyz Republic is severely affected by the negative impacts of climate change. [...] The Kyrgyz Republic therefore established the Group of Friends of Mountainous Countries and calls on all to engage in broad and fruitful cooperation within that framework. [...] During this seventy-fourth session of the General Assembly the Kyrgyz Republic intends to again co-sponsor the updated draft resolution on sustainable mountain development. [...] The Government of the Kyrgyz Republic has now submitted the Paris Agreement on Climate Change for ratification by the country's Parliament".

Cooperation in Central Asia. “The Kyrgyz Republic attaches particular importance to cooperation in the Central Asian region, which is developing dynamically. [...] At the same time, in Central Asia there are still problems, whose successful resolution requires the collective efforts of the countries of the region. It is necessary to address, as a matter of priority, the demarcation of State borders, which will make it possible to ease social tensions in such areas and prevent border incidents. [...] Today, Central Asian countries must remove obstacles towards economic cooperation and increasing the region’s transit potential”.

Water and energy resources. “Separately, we are addressing the integrated use of water and energy resources in the region. Forming the main freshwater reserves, as part of existing relations, the Kyrgyz Republic seeks to receive appropriate economic compensation for the storage and conservation of water resources. Those resources are important not only to the region but for the preservation of the entire global balance. Kyrgyzstan therefore supports establishing an integrated administration for water-resource management and proposes developing economic mechanisms in Central Asia for establishing mutually beneficial cooperation in the hydro-energy sector. We are also focusing on producing green electric power. The implementation of hydroelectric projects will ensure that we meet the needs of Central Asian countries in terms of hydropower, thereby creating conditions conducive to sustainable

development across the entire region. In the context of 2030, we believe equal attention should be paid to the achievement of SDG 7 on ensuring access to affordable and clean energy. In that regard, the Kyrgyz Republic is working to implement the CASA-1000 project. From a regional perspective, Kyrgyzstan considers cooperation and comprehensive dialogue to be the only possible way to resolve existing issues in this area”.

Access to clean drinking water. “Ensuring access to safe and affordable drinking water is an urgent issue for our country. According to FAO, Kyrgyzstan, while an area of Central Asia that is a significant source of water supplies, has the lowest per capita access to drinking water in the region. In rural areas, about 40 per cent of the population is not adequately provided with clean drinking water. In order to deal with that, my Government is currently implementing its Taza Suu project – meaning “clean water” – designed to provide villages with clean drinking water. In that connection, we urge international organizations, financial institutions and donor countries to support my country’s efforts in promoting such projects. [...]”.

Mr. Aidarbekov underlined Kyrgyzstan’s multilateral and fruitful co-operation with UN agencies and said his country put forward its candidacy for non-permanent membership in the Security Council for the period from 2027 to 2028.

Full text in English:

<https://undocs.org/en/A/74/PV.11>

Address by the Prime Minister of the Republic of Tajikistan

Speaking from the rostrum of the UNGA, Tajik Prime Minister Mr. Qohir Rasulzoda touched upon the problems of terrorism, organized crime and drug trafficking. He spoke about efforts to ensure stability in Afghanistan and recalled the impact of climate change on Tajikistan and Central Asia as a whole, particularly, the rise in temperature, rapid melting of glaciers and increased natural disasters. The Head of the Government spoke also in favor of the hydroelectric power development.

Terrorism, extremism, and drug trafficking threaten Tajikistan’s security. “Terrorism and extremism, together with transnational organized crime and illicit drug trafficking, undermine international peace and security, aggravate conflicts and destabilize entire regions. [...] We believe it important to advance our countries’ efforts to promote peace, stability and security

in Asia, which should focus on dismantling the military infrastructure of international terrorism, denying it political, military and financial support and preventing the misuse of the Internet for radicalization, recruitment and propagandizing for extremism and violence”.

Afghanistan. “Security and stability in Central Asia are closely linked to developments in Afghanistan. Tajikistan’s border with Afghanistan is the longest of any country, and since the first days of our independence we have therefore worked consistently to promote lasting peace and stability in our neighbor. We are also making a practical contribution to Afghanistan’s social and economic development by connecting our two countries’ transport corridors through an energy bridge, the CASA-1000 project, which provides the Afghan people with electricity and essential commodities, as well as

by training specialists. One of the important areas in that regard is involving Afghanistan in the process of multilateral regional cooperation and creation of conditions that will help to fulfill the transit potential of the country and the region. Tajikistan fully supports the efforts of the Afghan authorities to establish a peaceful negotiation process. [...]"

Sustainable Development Goals. "This is a very important year for taking stock of the results of implementation of the 2030 Agenda. The four-year cycle of the High-level Political Forum on Sustainable Development has been successfully completed. [...] In that regard, we support the call of the Secretary-General to act urgently and with purpose in order to successfully implement the 2030 Agenda in a timely manner. [...] We have adopted a national development strategy for the period up to 2030 and a medium-term development plan from 2016 to 2020, both of which fully align with the 2030 Agenda and are key tools for ensuring national ownership of the SDGs in Tajikistan. However, we are also dealing with an array of new issues and problems. [...]"

Climate change. "Climate change seriously affects the process of achieving SDGs and their targets. [...] Over the past 60 years, the average annual air temperature in Tajikistan has increased by 1°C. The number of days with heavy precipitation has increased, as have the frequency and intensity of natural hydrometeorological events. Water-related natural disasters alone cost our economy hundreds of millions of dollars in damage every year. The negative impact of climate change on the quantity and quality of the world's freshwater resources is also becoming increasingly evident. In the past few decades Tajikistan has seen the surface area of its glaciers, which are vitally important to the whole of Central Asia, shrink significantly. In that regard, we believe it is essential to strengthen cooperation among countries in order to address the consequences of natural disasters by developing preventive measures and mobilizing funds to assist countries in need. It is also essential to enhance the monitoring of glaciers, snow and other water sources and take effective steps to protect them for future generations".

Green energy. "We consider it vital to promote development of a green economy in every way, and particularly green energy, which is a crucial component of sustainable development. Expanding the use of renewable energy,



principally hydroelectricity, contributes to Tajikistan's economic and social development while keeping harmful emissions into the atmosphere as low as possible. Hydropower plants, which generate about 98 per cent of our electricity, form the basis of the country's energy sector. The Government has been taking comprehensive measures to balance energy production and consumption by modernizing and upgrading our existing hydropower stations, building new ones and introducing modern energy-conservation methods".

Water issues. "Tajikistan is a leader in promoting water issues at the global level. It is well known that in the past few decades, at the initiative of President Rahmon four important global initiatives were endorsed by GA. [...] In 2018, we began implementing our fourth global initiative, the International Decade for Action "Water for Sustainable Development" 2018-2028, which envisages two important global events: (1) a UN conference on the midterm comprehensive review of implementation of the International Decade for Action "Water for Sustainable Development" in 2023; (2) a high-level meeting of the General Assembly to promote the implementation of water-related goals and targets of the 2030 Agenda in 2021. In this context, the Republic of Tajikistan, as part of the Dushanbe process, will hold the second conference on the implementation of the International Decade of Action, entitled "Galvanizing water-related actions and partnerships at the local, national, regional and global levels", in Dushanbe in June 2020.[...]"

Full text in English: <https://undocs.org/en/A/74/PV.9>

Address by the Minister of Foreign Affairs of Turkmenistan



Water issues should be considered based on the principles of mutual respect and consent and consideration of the interests of all States that share basins of transboundary rivers, water sources and shared-border lakes

Preventive diplomacy, active role of the UN in ensuring global security, partnership in transport, water conservation, as well as promoting SDGs and addressing issues related to development financing. Speaking at the UNGA, the Minister of Foreign Affairs of Turkmenistan Rashid Meredov voiced his country's priorities.

Peace, security, and neutrality. Turkmenistan supports active international cooperation to ensure peace and security and believes that the United Nations should play a central role in this regard. According to Mr. Meredov, countries should "find a reasonable balance between national interests and those of the entire international community". "The key is [...] the restoration and reinforcement of trust and predictability, which are vital factors in building constructive relations in the international arena and making informed and responsible decisions". In this context, Turkmenistan proposed to declare 2021 as the International Year of Peace and Trust. The Minister underlined preventive diplomacy as a tool promoting comprehensive peace and security. "As experience has shown, preventive diplomacy under the auspices of the United Nations can produce real results. That is particularly evident in the work of the United Nations Regional Centre for Preventive Diplomacy for Central Asia, which serves as an effective link between UN and the countries of Central Asia". The Minister also informed that next year Turkmenistan would mark the twenty-fifth anniversary of the international recognition of Turkmenistan's permanently neutral status. In that connection, an international conference on issues of peace, security and development

will be held in Ashgabat in December 2020. Turkmenistan proposed to develop a United Nations code of rules for the effective application of the principles of neutrality in resolving international issues.

Sustainable development. "Cooperation with UN on sustainable development issues remains a priority for all of us in the long term. It is clear that despite the efforts that have been made, the implementation of the 2030 Agenda is encountering various problems, including financial ones. In our opinion, they can be overcome if we harness political will and our efforts are properly organized. It will be essential to ensure a clear algorithm and the coordinated provision of adequate financial resources for specific projects and programs aimed at achieving SDGs. To that end, we think we should consider convening a UN conference on financing for development. [...]"

Initiatives on the Caspian and Aral Seas. "The environment and its protection have traditionally been central to Turkmenistan's activities at the United Nations. During this session my country will add the Caspian Sea issue to its list of well-known environmental initiatives. In August Turkmenistan held the first Caspian Economic Forum, at which the President of Turkmenistan launched an initiative creating a new Caspian environment programme at UN. Considering the universal importance of preserving the Caspian Sea as a unique natural complex, we hope to have the support of the international community for that initiative. Another important item for Turkmenistan on the agenda for this session is saving the Aral Sea. We will continue to work diligently to promote the idea of establishing a special United Nations programme for the countries of the Aral Sea basin, and we invite all interested parties to take part in the consultations on that subject".

Climate change. "The implementation of international agreements on climate change reached within the framework of UN is a major focus for my country. With a view to mobilizing activity aimed at fulfilling our commitments under SDGs and the Paris Agreement on Climate Change, the President of Turkmenistan approved our updated national strategy on climate change on 23 September, the very day of the Climate Action Summit in New York".

Water issues. "The issue of the conservation and use of water resources is one of the most important and urgent challenges of our time. It is not an

exaggeration to say that today the course of various global processes and the prospects for ensuring stability, development and well-being all over the world depend to a large degree on its resolution. Water issues, which have political, economic and social implications, require international consensus and demand that states concert their efforts on a common platform, where secondary and local interests and benefits must give way to an acknowledgement of truly global aims and priorities and the creation of a unified long-term strategy of action. The key condition for such concerted activity should continue to be an unconditional commitment to the principle of fair and equitable access to water resources and the recognition that it is a basic human right. Ensuring and assuming responsibility for the right of access to water is an obligation for every state, primarily because water is a common good for every people on our planet.

In adhering strictly to those principles, Turkmenistan has formulated a detailed position on water issues that can be summed up as follows.

First, water issues in various regions of the world should be addressed based on the universally recognized norms of international law and the relevant UN conventions in particular.

Secondly, water issues should be considered based on the principles of mutual respect and consent and consideration of the interests of all States that share basins of transboundary rivers, water sources and shared-border lakes. In that regard, Turkmenistan opposes the construction of new hydraulic facilities on transboundary rivers, which is linked to high environmental, socioeconomic and humanitarian risks.

Thirdly, we support greater and more active involvement of international organizations in addressing water issues. [...]”.

Full text in English:

<https://undocs.org/en/A/74/PV.12>

Uzbekistan – Vice Chairman of the 74th session of UNGA

During the 73rd Session of the UNGA, Uzbekistan for the first time was elected as a Vice-Chairman of the 74th Session of the UNGA. The representative of Uzbekistan assumed his duties in September 2019 and will assist the UNGA Chairman to lead the activities of this body until September 2020. The terms of reference of the Vice-Chairmen are to open and close each UNGA plenary meeting during the absence of the Chairman, moderate the debates of plenary sessions, maintain order at the meetings, particularly, by giving the floor to Member States, putting questions to vote and announcing decisions thereon.



Selected Resolutions adopted by the 74th Session of the UNGA

Selected resolutions on water, environment and development issues: Agriculture development, food security and nutrition ([A/RES/74/242](#)); Natural plant fibres and sustainable development ([A/RES/74/240](#)); Science, technology and innovation for sustainable development ([A/RES/74/229](#)); Sustainable mountain development ([A/RES/74/227](#)); Combating sand and dust storms ([A/RES/74/226](#)); Ensuring access to affordable, reliable, sustainable and modern energy for all ([A/RES/74/225](#)); Harmony with nature ([A/RES/74/224](#)); Report of the United Nations Environment Assembly of the United

Nations Environment Program ([A/RES/74/222](#)); Implementation of the Convention on Biological Diversity and its contribution to sustainable development ([A/RES/74/221](#)); Implementation of the United Nations Convention to Combat Desertification in those countries experiencing serious drought and/or desertification, particularly in Africa ([A/RES/74/220](#)); Protection of global climate for present and future generations of humankind ([A/RES/74/219](#)); Disaster risk reduction ([A/RES/74/218](#)); Agricultural technology for sustainable development ([A/RES/74/215](#)); Sustainable tourism and sustainable develop-

ment in Central Asia (A/RES/74/214); Cooperative measures to assess and increase awareness of environmental effects related to waste originating from chemical munitions dumped at sea (A/RES/74/213); International Day of Clean Air for blue skies (A/RES/74/212); International Day of Awareness of Food Loss and Waste (A/RES/74/209); The law of transboundary aquifers (A/RES/74/193); Consideration of prevention of transboundary harm from hazardous activities and allocation of loss in the case of such harm (A/RES/74/189); The right to development (A/RES/74/152); The right to food (A/RES/74/149); The human rights to safe drinking water and sanitation (A/RES/74/141); Prohibition of the dumping of radioactive wastes (A/RES/74/58); The Situation in Afghanistan (A/RES/74/9); Report of the International Atomic Energy Agency (A/RES/74/8).

Source: www.un.org/en/ga/74/resolutions.shtml

The law of transboundary aquifers on the agenda of the General Assembly. At its 2nd plenary meeting, on 20 September 2019, the General Assembly decided to include the item entitled “The law of transboundary aquifers” in its agenda and to allocate it to the Sixth Com-

mittee. The Sixth Committee considered the item at its 21st, 34th and 35th meetings, on 22 October and 11 and 20 November 2019. At the 35th meeting, on 20 November, the Committee adopted draft resolution A/RES/74/193 that

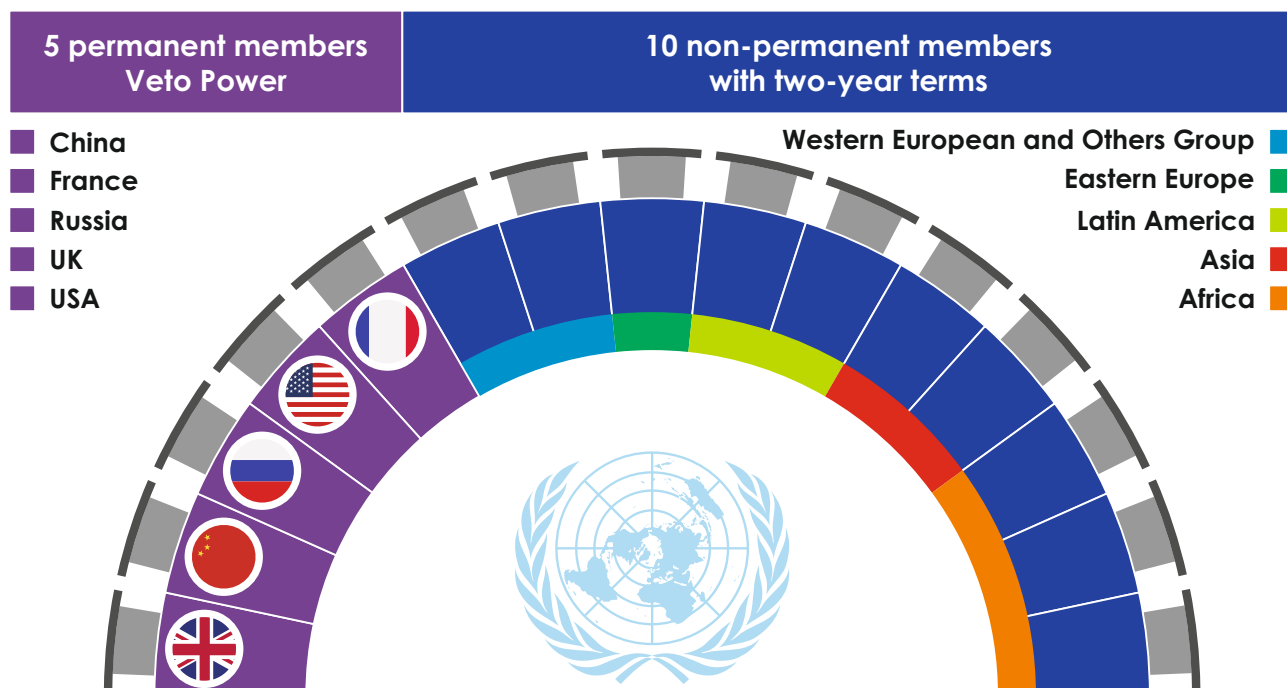
1. Commends to the attention of Governments the draft articles on the law of transboundary aquifers annexed to its resolution 68/118 as guidance for bilateral or regional agreements and arrangements for the proper management of transboundary aquifers;

2. Encourages the International Hydrological Program of the UNESCO to continue its contribution by providing further scientific and technical assistance upon the consent of the recipient State and within its mandate;

3. Decides to include in the provisional agenda of its seventy-seventh session (2022) the item entitled “The law of transboundary aquifers”.

Source: www.un.org/en/ga/sixth/74/transboundary_aquifers.shtml; <https://undocs.org/pdf?symbol=en/A/74/431>

6.2. Security Council



The **Security Council** (UNSC) has primary 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 (China, France, Great Britain, Russia, USA,) and 10 non-permanent members elected by the General Assembly for two-year terms for 5 countries each year.

UNSC open debate on addressing the impacts of climate related disasters on international peace and security

On 25 January, the Dominican Republic, as President of UNSC for the month of January, organized an open debate on addressing the impacts of climate-related disasters on international peace and security. The debate marked the fourth time that UNSC had devoted time to deliberating the impacts of climate change on international peace and security in a formal meeting, and the first open debate since that organized in 2011 under the German presidency of the Council. Over the past two years, the Security Council has increasingly recognized climate and environmental change-related security risks in different regional contexts, in particular in the Lake Chad region (see Council resolution [2349](#) (2017)), Somalia (see Council resolution [2408](#) (2018)), West Africa and the Sahel (see [S/PRST/2018/3](#)), Mali (see Council resolution [2423](#) (2018)) and Darfur (see Council resolution [2429](#) (2018)).

Many delegations underscored the need to go beyond discussing the impacts of climate-related disasters on security and to take action to strengthen resilience, noting the critical role that international cooperation needed to play in combating climate change and its multiple negative effects. In that vein, they made a number of suggestions. Thus, many delegations:

(1) stressed the need for a better and more systematic understanding of how the risks related to climate change and disasters impact international peace and security;

(2) called for better early warning capabilities and early action enabled by integrated risk assessments and risk management strategies at the level of national governments, regional organizations and United Nations regional offices, improved analytical capacities and better disaster preparedness, with one speaker summarizing that “if we predict better through early warning and prepare better through early action, we can prevent conflict”;

(3) requested the better integration of climate-related factors into the mandates and capabilities of United Nations field missions, with some suggesting that peacekeepers could be equipped with capacities to undertake military operations other than war such as “climate peace missions”, as long as those focused on assisting but not interfering with affected countries;

(4) stressed the need to support developing countries by means of financing, capacity-building and technology transfers to prevent climate security threats and conflicts.

Sources:

<https://digitallibrary.un.org/record/1664428>;

<http://webtv.un.org/search/part-1-open-debate-on-the-maintenance-of-international-peace-and-security-addressing-the-impacts-of-climate-related-disasters-on-international-peace-and-security-security-council-8451st-meeting-5995992706001/?term=%22Addressing%20the%20i>

UNSC Arria-formula meeting on protection of the environment during armed conflict

On 9 December, an open Arria-formula meeting on the “Protection of the Environment during Armed Conflict” hosted by Estonia, Germany, Kuwait and Peru has been held. As the world watched more than 600 burning oil wells in Kuwait blackening the horizon during the first Gulf War in 1991, it was a reminder of the obvious impact of military activities on the environment and the people depending on it. That is why November 6 was declared the International Day for Preventing the Exploitation of the Environment in War and Armed Conflict in 2001. Numerous examples from conflicts in the Balkans, the Middle East, Central Asia, South America, and Africa have showed us how ecosystems can be damaged from military toxins, how forests disappear as a result of war-

economies, how the targeting of water infrastructure damages agriculture and livelihoods, and how the collapse of environmental governance in conflicts results in large waste management problems and communicable diseases, among other issues.

There have been small steps to make progress to address the responsibilities of warring parties concerning the environment, to improve humanitarian responses and include environmental restoration and protection in post-conflict reconstruction. The International Law Committee published its draft legal principles on protection of the environment in relation to armed conflict (PERAC); the International Committee of the Red Cross is working to update its

guidelines for the military on the environment, while also calling for more attention on the links between warfare and the environment.

The meeting provided a platform for Members of the Security Council to address the interlinkages between the environment and armed conflict, building from the initial discussions on the PERAC agenda and delving more deeply into current needs for language and cooperation in response to previous and ongoing degradation of the environment cau-

sed by armed forces in conflicts on the Council's agenda.

Sources: <http://webtv.un.org/search/arrria-formula-meeting-on-protection-of-the-environment-during-armed-conflict/6114430670001/?term=%22Protection%20of%20the%20Environment%20during%20Armed%20Conflict%22&sort=date4;>

www.whatsinblue.org/2019/12/arrria-formula-meeting-on-the-protection-of-the-environment-during-armed-conflict.php

6.3. Secretariat



"Global challenges require global solutions. It is not enough to proclaim the virtue of multilateralism; we must prove its added value."
 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 1, 2017, Antonio Guterres is the Secretary-General (Portugal).

Each year, the Secretary-General reports on the work of the Organization, including priority

areas of the UN's activity and future plans. [2019 Report](#) highlights the work in the following areas: promotion of sustained economic growth and sustainable development; maintenance of international peace and security; development of Africa; promotion and protection of human rights; effective coordination of humanitarian assistance efforts; promotion of justice and international law; disarmament; drug control, crime prevention and combating terrorism.

The Report highlights key elements of the Secretary-General's major reform initiatives announced in 2018-2018 and including reform of the **development systems** (launched a new generation of United Nations country teams centered on Sustainable Development Cooperation Frameworks and led by empowered Resident Coordinators); **management** (launched a new decentralized delegation of authority, accountability and monitoring framework, operational support and policy support); **peace and security** (to prioritize prevention and sustaining peace, enhance effectiveness of peace operations, move towards a single, integrated peace and security pillar, and improve cross-pillar coordination).

Source: <https://www.un.org/annualreport/>

6.4. United Nations Development Program



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 Activity in the Central Asian States in 2019

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 2019, UNDP [project](#) portfolio in Kazakhstan included 25 projects with overall budget of US \$18.14 million.

SDGs. Since 2018, the “[Partnering for Building a National SDG Platform](#)” project (2018-2019) is being implemented to support the government to nationalize, implement and monitor the SDGs. In 2019, the [Kazakhstan’s first Forum](#) on SDGs was held within the Astana Economic Forum (April, Nur-Sultan); Kazakhstan [presented](#) its first Voluntary National Review during the High-Level Political Forum on Sustainable Development, United Nations’ central platform for follow-up and review of the 2030 Agenda and SDGs (16 July, New York).

Water management. Since 2017, the “[Irrigation and Drainage in South Kazakhstan, Capacity Building and Awareness Raising](#)” project (2017-2021) has been implemented; it is designed to develop the capacities of RSE “Kazvodkhoz” and its branches in Almaty and Turkestan regions by changing institutional management and improving irrigation water management. In 2019, the project documented 22 water saving and water counting best practices, developed nine user’s manual, selected four farms for demonstration of innovative system for water measurement, set two pilot farms to monitor soil salinization and ground water systems, covered six community settlements on new tariff/billing system, equipped four water extension centers, 67 staff of Kazvodkhoz have improved knowledge through exchange programs.

Land and ecosystems related projects implemented in 2019 include: [Conservation and Sustainable Management of Key Globally Important Ecosystems for Multiple Benefits in Kazakhstan](#) (2017-2021); [Sixth Operational Phase of the GEF Small Grants Programme](#) (2017-2021) focusing on resilient rural and peri-urban

landscapes of steppe and desert ecosystems for sustainable development and global environmental protection; [Integrated Dryland and Drought Management in South Kazakhstan](#) (2017-2019) aimed at improving livelihood strategies and resilience of vulnerable farmers and pastoral communities in the selected pilot sites to cope with drought; [Supporting Sustainable Land Management](#) (2015-2020) with a view of transformation of land use practices in critical, productive, steppe, arid and semi-arid landscapes of Kazakhstan; [Sustainable Food Systems and Improved Ecosystems Service in Northern Kazakhstan](#) (2019-2020) aimed at restoration and sustainable management of cropland and grasslands in Kazakhstan in line with LDN concept for multiple lands, climate and biodiversity and economic benefits.

Energy and climate change related activities in 2019 include [Low-carbon Urban Development](#) (2014-2019); [Energy Efficient Standards, Certification, and Labelling](#) (2017-2021) seeking to transform Kazakhstan’s markets to energy efficient appliances and equipment, thereby reducing electricity consumption and GHG emissions; [De-risking Renewable Energy Investment](#) (2017-2021); Preparation of the [Eighth National Communication and Biennial Reports](#) (2019-2022) to the Conference of the Parties of the UNFCCC in accordance with the commitment to the UNFCCC; [Reduction of Greenhouse Gas Emissions](#) (2019-2021) to assist Kazakhstan in fulfilling international obligations to reduce greenhouse gas emissions by reducing the carbon footprint of electricity suppliers for the leading technology company Bitfury.

Since 1995, UNDP has been involved in the development of the **National Human Development Reports** (NHDR). In 2019, UNDP has launched its NHDR “[Urbanization as an accelerator of inclusive and sustainable development in Kazakhstan](#)”.

Sources: <https://www.kz.undp.org> and <https://open.undp.org/projects>

UNDP in Kyrgyzstan

UNDP interventions in Kyrgyzstan are guided by the [United Nations Development Assistance Framework \(UNDAF\) for the Kyrgyz Republic 2018-2022](#), which outlines four priorities: (1)

sustainable and inclusive economic growth, industrial, rural and agricultural development, food security and nutrition; (2) good governance, rule of law, human rights and gender equa-

lity; (3) environment, climate change, and disaster risk management; (4) social protection, health and education.

In 2019, UNDP [project](#) portfolio in Kyrgyzstan included 27 projects with overall budget of US \$20.5 million.

Environment related projects implemented in 2019 include: Conservation of globally important biodiversity and associated land and forest resources of [Western Tian Shan mountain](#) forest ecosystems to support sustainable livelihoods (2017-2021) (*preliminary results were presented on the 18th of December at the Project Advisory Board meeting*); [Disaster Risk Reduction and Climate Change](#) (2016-2020) that seeks to strengthening integrated risk governance capacities and regional cooperation in CA; [Capacity in Sustainable Development Finance](#) (2018-2020); [Snow Leopard and Ecosystem](#) (2016-2020) seeking to strengthen transboundary conservation for snow leopards and their high mountain ecosystems to ensure stability of global snow leopard population; [National SDGs Adaptation](#) (2018-2020) to support the Government to enhance national capacities and raise awareness on SDG-based issues; [Climate Resilience of the Batken Province](#) (2019-2020) aimed at strengthening climate resilience of the

Batken Province of the Kyrgyz Republic through introduction of climate smart irrigation and mudflow protection measures under the UNDP Trust Fund for Development Climate Change Window (*the [coordination meeting](#) was held on the 22nd of October*); [Capacity Building in Environment](#) (2018-2022) towards securing the resilience of communities and institutions to climate and disaster risks and sustainable and inclusive natural resource management; [UN Support for Strengthening Disaster Preparedness](#) (2012-2020) to support the coordination activities of the Disaster Response Coordination Unit (DRCU) Secretariat; [HCFC Phase-out Management Plan \(HPMP\) – Stage 2 \(full\)](#) (2015-2020) for complete HCFC⁵² phase-out by 2020; [Monitoring System and Management of Environment Info](#) (2015-2019) to strengthen targeted national capacities to meet Rio Convention objectives through improved procedures and tools to monitor and manage environmental information; [Protect Human Health from Persistent Organic Pollutants](#) (2014-2018) to implement and adopt Best Environmental Practices and Best Available Technologies in healthcare facilities throughout the City of Bishkek to improve the management, treatment, and disposal of healthcare waste.

Sources: www.kg.undp.org and <https://open.undp.org/projects>

UNDP in Turkmenistan

In 2019, UNDP [project](#) portfolio in Turkmenistan included 22 projects with overall budget of US \$13.5 million.

Water management. UNDP together with the State Committee for Water Management of Turkmenistan is implementing the "[Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan](#)" project (2015-2021) funded by GEF. In 2019 the following results has been achieved: (1) improved efficiency of municipal water supply in the town of Kaahka led to water savings that was used by local residents for reclamation of around 300 ha and sowing traditional crops; (2) five physically worn obsolete pumps were replaced by brand new energy efficient ones in 2019; (3) installation of photovoltaic solar panels in three villages of Karakum desert to power water withdrawal from wells and purification/desalination of water in one of the villages; (4) methodology on development of inter-farm water use plans and

its demonstration to national water specialists through the seminar; (5) over 280 national specialists have been trained locally and abroad since the beginning of the project in various topics related to rational water management, energy efficient irrigation techniques, pump maintenance and SLM; (6) four regulatory acts to support Water Code developed, including operational regulations for pump stations; regulation for scheduled preventive maintenance and repair of water systems and facilities; technical regulations of irrigation infrastructure; and technical regulations of drainage infrastructure; (7) the National Program for the Development of Agriculture of Turkmenistan for 2019-2025 adopted. More than 120 pumps of the SNP-500/10 and SNPE-500/10 brands [were audited](#). The pumps belong to the State Committee for Water Resources of Turkmenistan. Based on the conducted audit, recommendations were made on the optimal placement of suction and pressure pipelines of pump-

⁵² Hydrochlorofluorocarbon

ping stations and the rational use of electric power equipment, ensuring the most efficient use of energy for the necessary pump performance.

The following events were held:

- EU project “Support to Further Sustainable Agriculture and Rural Development in Turkmenistan (SARD III)” organized [a study visit](#) for specialists from the agricultural and water sectors of Turkmenistan to the University of Cordoba to familiarize the specialists with the agricultural practices in Spain and, in particular, the rational distribution and use of irrigation water in the hottest province of the country Andalusia which is similar in climatic conditions to Turkmenistan (14-20 July, Cordoba, Spain);
- [workshop](#) for agricultural and water specialists, land users – agricultural producers in order to familiarize them with the main results of research and production activities on improvement of degraded and salinized lands using modern irrigation technologies and agricultural work (23 October, Ashgabat);
- [seminar](#) to improve monitoring of the use of water resources and planning for water use in irrigation systems (20 December).

Climate change. UNDP [creates a platform](#) for national and international experts in the spheres of climate change, mitigation and adaptation to revise and create an updated version of the

UNDP in Uzbekistan

UNDP interventions at country level are guided by the Country Program Document for the period of 2016-2020, which includes four outcome areas: (1) inclusive economic development, with focus on employment and social protection; (2) environmental protection to ensure sustainable development; (3) effective governance to enhance public service delivery; and (4) protection of rights.

In 2019, UNDP [project](#) portfolio in Uzbekistan included 34 projects with overall budget of US \$16.4 million.

SDGs. UNDP is implementing the “[Support to Policy Research for Sustainable Development](#)” project to support the Government of Uzbekis-

tan National strategy on climate change of Turkmenistan and prepare the Action plan for implementation of the Paris Agreement. In 2019, two climate-related projects were implemented: Preparation of Turkmenistan’s Fourth National Communication (NC4) and Initial Biennial Update Report (BUR1) under the UNFCCC; [Supporting Climate Resilient Livelihoods in Agriculture](#) to support climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan (2016-2021).

The following events were organized:

- UNDP and the Ministry of Education of Turkmenistan held the [final workshop](#) on preparation of the training manual “Climate Box” to use in class and during extracurricular hours (4 April, Ashgabat);
- [national seminar](#) on access to international climate financing for implementation of the National Climate Change Strategy of Turkmenistan (17 December, Ashgabat).

Other relevant projects implemented in 2019 include: [Sustainable Cities](#): Integrated Green Urban Development in Ashgabat and Awaza (2017-2023); [Partnering for SDG Acceleration](#) aimed at strengthening the capacity of the Ministry of Finance and Economy of Turkmenistan as a responsible authority for coordinating and monitoring the implementation of SDGs (2018-2020).

Sources: www.tm.undp.org and <https://open.undp.org/projects>

tan in policy research, formulation, planning and monitoring for the post-2015 sustainable development agenda, in particular SDGs (2017-2019).

Water management. UNDP continued to implement the “[Sustainable Management of Water Resources in Rural Areas](#)” project in Uzbekistan: Component 2 on Technical Capacity Building EU-WATER project (2016-2020). Key results in 2019 include: (1) improvement of material-technical base of TIAME, Institute of Irrigation and Water Problems, MoWR, and six BISAs; (2) irrigated land reclamation monitoring system is created at national level by equipping the central office of the Ministry and 13 regional reclamation expeditions with modern equip-

ment and software products; (3) capacity building programme and five training modules prepared, 54 trainers trained, 560 water professionals enhanced their professional skills through training courses; (4) water losses reduced by about 30-40% in project pilot sites due to reconstructions of canals, construction and repair of water gates, construction of pump stations; (5) a series of regulatory documents to support sustainability of water management developed; (6) 7,600 hectares of irrigated agricultural lands were returned to production and water supply was improved on 8,200 hectares.

Climate related activities implemented in 2019.

UNDP continued to implement the “[Developing Climate Resilience](#)” project to develop climate resilience of farming and pastoral communities in the drought prone parts of Uzbekistan, specifically Karakalpakstan (2014-2021). The following events were held: [seminar](#) “Modern methods of decision-making by local authorities and the inclusion of climate change factors in them” (15 November, Samarkand); [round table](#) “Towards Transition of the Aral Sea Region from Disaster Prone Zone to Zone of Innovations and Sustainable Development (Agriculture Sector)”, which presented the results of piloting agro- and water-saving practices and measures to restore natural degraded pastures (23 November, Nukus). In 2018-2019, 10 pasture communities were created with a cooperative management principle in 5 pilot areas of the project in Karakalpakstan. Today, these communities brought together 47,830 rural residents, who are working to restore degraded pastures and create new ones. To support the initiative, 34,960 ha of territories were allocated by the local authorities of the pilot districts to pasture cooperatives for a period of 25-30 years.

Other climate-related activities/projects: [Green Climate Fund \(GCF\) Readiness Program in Uzbekistan](#) to support the Government of Uzbekistan in strengthening their national capacities to effectively and efficiently plan for access, manage, deploy and monitor climate financing in particular through the GCF (2015-2019); [Resilience of Farming to Climate Change Risks in Fergana](#) aims to institutionalize integrated services to agricultural producers in the pilot region that enhance their adaptation to the impacts of

climate change (2019-2021); [Promoting Green Urban Development in Tashkent](#) to accelerate the adoption of electric vehicles in the City of Tashkent that can be replicated in other cities in RUz, significantly reduce greenhouse gas emissions in the transport sector, and improve urban environmental quality (2019-2020). Young scientists from Inha University in Tashkent, with the support of UNDP, developed a [weather station](#), pheromone traps and special software which allows keeping records of farms and sending out SMS alerts about the spread of diseases and pests of plants. The main advantages of these inventions are their affordable cost compared to imported analogy, more accurate prediction due to adaptation to local entomology, and availability of Uzbek interface.

Land management and ecosystem related activities. [Integrated Landscape Management \(LAND\)](#) to support the improved, more sustainable and more resilient land use management of non-irrigated arid desert, steppe and mountain landscapes of Uzbekistan (2014-2019); [Sustainable Development of Mountain Ecosystems](#) with the aim of improving sustainable natural resource use and forest management in key mountainous areas important for globally significant biodiversity (2017-2022); [Sustainable Rural Housing and Settlements in Uzbekistan](#) to transform the rapidly growing rural housing sector in Uzbekistan towards a more sustainable and low-carbon development pathway by designing, piloting and scaling-up a green mortgage market mechanism (2015-2023); [Complete HCFC Phase-out in Uzbekistan](#) through Promotion of zero ODS⁵³ low GWP Energy Efficient Technologies (2018-2024).

Activities in the Aral Sea. [Building the Resilience of Communities Affected by the Aral Sea Disaster](#) through a Multi-Partner Human Security Fund for the Aral Sea (2016-2019); [Addressing the Urgent Human Insecurities in the Aral Sea](#) to address the environmental, social and economic insecurities in the most vulnerable communities of the Aral Sea (2019-2021) (see Section “[Comprehensive Remote and Ground Surveys of the Dried Bed of the Aral Sea](#)”).

Sources: www.uz.undp.org and <https://open.undp.org/projects>

⁵³ Ozone-depleting substances

UN Multi-Partner Human Security Trust Fund for the Aral Sea Region in Uzbekistan

On 27 November, 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).

MPHSTF Activities in 2019

Three meetings of the MPHSTF's Steering Committee were held. The **first Steering Committee meeting** discussed the organizational and practical issues of the Trust Fund, including those related to the operational procedures and programmatic strategy of the Fund. The composition of the Technical Secretariat, the Operational Manual of the Trust Fund were discussed and approved, the date of announcement of the first Call for proposals was agreed ([24 January](#)). The **second Steering Committee meeting** approved two project proposals with a total budget of US \$ 3.1 million: [Improvement of Quality in Perinatal Care Service to Most Vulnerable Mothers and Newborns](#) (UNFPA/UNICEF, US \$1.6 million) and [Addressing the Urgent Human Insecurities in the Aral Sea Region through Promoting Sustainable Rural Development](#) (UNDP/UNESCO, US \$1.5 million). The **third Steering Committee meeting** discussed the establishment of an Advisory Committee on Sustainable Development of the Aral Sea region on the platform of the Trust Fund. The establishment of the Advisory Committee as a single platform will allow for constructive dialogue between the government, civil society and development partners on various aspects of the development of the Aral Sea region ([16 December](#)).

Allocated funds. The Government of Uzbekistan and the UN Multi-Partner Trust Fund Office in New York signed a Standard Agreement confirming a contribution of US \$6.5 million by Uzbekistan to MPHSTF. The transfer will be made in four tranches from 2019 to 2022 (27 November). In 2019, the [first tranche](#) in the amount of US \$2 million was transferred. Agreements were signed for US \$1.1 million with the Government of Norway ([1 April](#)) and €5.2 million with EU (11 November) to support MPHSTF.

Ongoing projects. The "Addressing the Urgent Human Insecurities in the Aral Sea Region through Promoting Sustainable Rural Development" project was launched. The project goal is to address the environmental, social and eco-

economic insecurities in the most vulnerable communities of the Aral Sea region ([26 September, Nukus](#)) by bringing comprehensive solutions to addressing environmental issues, promoting access to basic services, improving the livelihoods, development of sustainable tourism in Takhtakupir, Muynak and Chimbay districts of Karakalpakstan. The project will provide access to drinking water for more than 2,230 rural people; expand income generation opportunities for over 1,000 representatives of vulnerable communities through support to SMEs and community level eco-tourism development. Evidence-based afforestation initiatives in the dried bed of the Aral Sea will help to promote climate change adaptation actions in the pilot districts.

Within the framework of the project, SIC ICWC together with the International Innovation Center for the Aral Sea Basin under the President of the Republic of Uzbekistan [organized an expedition](#) to study the dried Aral Sea (20 September-20 October). The second expedition of the project is scheduled for spring 2020 (see Section "[Comprehensive Remote and Ground Surveys of the Dried Bed of the Aral Sea](#)").

[Improvement of Quality in Perinatal Care Service to Most Vulnerable Mothers and Newborns](#) project aimed at ensuring access of the population to perinatal services by improving infrastructure and provision of essential equipment for level II perinatal referral facilities and increasing the quality of maternal and newborn health care services, and to increase the capacity of families to make informed choices about health and nutrition (August 2019-December 2020). The project will cover 8 out of 15 districts including 3 districts that have most suffered from land degradation, reduction of biodiversity, climate change, deterioration of the health of the population. It is expected that the project allows 26,000 pregnant women and newborns to receive quality perinatal care, while 500 medical workers are expected to improve their skills through dedicated training programs.

Sources: www.aral.mptf.uz, www.mfa.uz

6.5. UN Water



In 2013, 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.

The United Nations World Water Development Report, [Leaving no one behind](#), launched on 19 March, demonstrates how improvements in water resources management and access to water supply and sanitation services are essential to addressing various social and economic inequities. The Report is the result of collaboration between 32 United Nations entities and 41 international partners who make up UN-Water.

The 30th UN-Water Meeting was convened at the headquarters of IFAD [in early February](#). Participants addressed ongoing work on SDG 6 indicators, upcoming global awareness-raising events, and the UN General Assembly (UNGA) resolution that calls for two high-level meetings – one in 2021 and one in 2023 – on water and sanitation issues, and options for how UN-Water could contribute to the preparations for these meetings.

Meeting Coverage is available on: <http://enb.iisd.org/water/un/30/html/enbplus82num34e.html>

On [July 12](#), during the High-level Political Forum on Sustainable Development, a side-event on climate change and water was hosted. In the side-event, the UN-Water launched an update of its [Policy Brief](#) on Climate Change and Water.

This Brief has presented some recommended policies and actions for water-smart climate mitigation and adaptation measures, within and across sectors.

The 31st UN-Water Meeting was convened in Stockholm on [August 23-24](#). The participants discussed progress on and next steps for joint initiatives that UN-Water Members and Partners have undertaken to ensure that the UN is “delivering as one” to address global water challenges.

Meeting Coverage is available on: <http://enb.iisd.org/water/un/31/>

On [August 27](#), during the World Water Week in Stockholm, the UN-Water SDG 6 Data Portal was launched. The SDG 6 Data portal is now live on www.sdg6data.org. The portal brings together data on all the SDG 6 global indicators and other key social, economic and environmental parameters, and tracks overall progress towards SDG 6 at global, regional and national levels.

On [December 10](#), the UN-Water Expert Group on Water and Climate organized the side event “Climate-resilient Water Management Approaches” at the twenty-fifth session of the Conference of the Parties (COP25) to the United Nations Framework Convention on Climate Change (UNFCCC) in Madrid. Participants acknowledged the crucial role of integrated approach to climate change and water management for successful implementation of the 2030 Agenda, the Sendai Framework and the Paris Agreement. The panelists agreed that water-related mitigation and adaptation interventions should be appropriately included in nationally determined contributions (NDCs).

Source: www.unwater.org

6.6. UN Economic Commission for Europe



UN 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

UNECE serves as the Secretariat for the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention). In 2019, the Parties to the Convention, together with UNECE, other countries and

partners, launched the [Program of work](#) for 2019-2021 consisting of 7 program areas: increasing awareness of and accession to the Convention and application of its principles drawing on the experience of cooperation; supporting monitoring, assessment and information sharing in transboundary basins; promoting an integrated and intersectoral approach to water manage-

ment at all levels; adapting to climate change in transboundary basins; facilitating financing of transboundary water cooperation; reporting on SDG indicator 6.5.2 and under the Convention; partnerships, communication and knowledge management. Kazakhstan takes over the chairmanship of the Water Convention for the period of 2019-2021.

Activities in 2019

In 2019 under the Water Convention and Protocol on Water and Health, UNECE organized the following events: fourth meeting of the Global network of basins working on climate change adaptation (14-15 February); twenty-eighth meeting of the Bureau of the Water Convention (27-28 February); twenty-second meeting of the Bureau of the Protocol on Water and Health (5 April); Global workshop on Ecosystem-based Adaptation in Transboundary Basins (29-30 April); tenth meeting of the Task Force on Water and Climate (1 May); eighteenth meeting of the Compliance Committee (1-2 July); Regional workshop on SDG indicator 6.5.2 for the Pan-European region (21 October); fourteenth meeting of the Working Group on IWRM (22-24 October); twenty-ninth meeting of the Bureau of the Water Convention (24-25 October); fifth session of the Meeting of the Parties to the Protocol on Water and Health (19-21 November); tenth meeting of the Implementation Committee (2-3 December); Global workshop on exchange

of data and information in transboundary basins (4-5 December); fifteenth meeting of the Working Group on Monitoring and Assessment (6 December).

Details: www.unece.org/env/water/meetings

Development of a Handbook on Transboundary Water Allocation

In 2019, the handbook on supporting equitable and sustainable water allocation in the transboundary context has been in the process of development. The International Water Assessment Center is handling this process in Central Asia, addressing such issues as sustainable water allocation in the transboundary context and environmental flow – the basis for conservation of the ecosystem. The [technical meeting](#) of Experts on Water Allocation and Environmental Flow Assessment in the Transboundary Context was held on December 12-13 in Nur-Sultan.

UNECE Activities in Central Asia

Transboundary cooperation. In 2018, the project “Enhancing Climate Resilience and Adaptive Capacity in the Transboundary Chu-Talas Basin” (September 2015-December 2018), funded by the Finnish Ministry for Foreign Affairs under the FinWaterWei II Initiative, was concluded. It was aimed to establish a framework for regular and strategic climate change adaptation action in the Chu-Talas River Basin and enable the Chu-Talas Water Commission and local authorities to facilitate climate change adaptation in the basin. The Annex on climate adaptation to the Transboundary Diagnostic Analysis (TDA) and measures for climate change adaptation for the Strategic Action Program (SAP) have been developed. Although the SAP document was accepted at the 24th Session of the Chu-Talas Water Commission (27 February 2018), the document has never been approved at the government level till the end of the project. In 2019, UNECE continued supporting the SAP alignment and approval process by providing technical

expertise, discussing the issue with relevant agencies and supporting the Chu-Talas Water Commission Secretariat.

Project results are available on: www.unece.org/env/water/centralasia/chutalas.html#c65768 and in the brochure: www.unece.org/fileadmin/DAM/env/water/Chu-Talas/RUS_ClimateProofingChuTalas_web_10Dec2018.pdf

National Policy Dialogues. The work to support NPDs under the EU Water Initiative is ongoing in close cooperation with OECD and [WECCOOP2](#) project financed by EU. In 2019, particularly, the Steering Committee Meetings of NPDs and working groups were held in [Kazakhstan](#) and [Tajikistan](#). At these high-level meetings, representatives of ministries and agencies discussed pressing issues of water governance reform, including development and implementation of sectoral strategies and programs, as well as transboundary cooperation, ensuring safety of

hydraulic structures, prevention of accidental water pollution, work on the Public-Private Partnership on water supply and sanitation, etc. Members of the Steering Committees also discussed and made decisions on projects implemented by development partners. In 2019-2022, support to the NPDs in Central Asia will be continued under a new EU-funded project in the context of the new phase of the WECOOP program.

Cooperation on dam safety. The [third phase of the project](#) "Capacity Building for Cooperation on Dam Safety" in Central Asia was continued. In 2019, the project supported a number of activities in the field of dam safety management in Central Asia. A [regional meeting](#) enabled countries take stock of the results achieved under the project as well as exchange experiences (1-3 May, Tashkent). One of the key outcomes of the meeting was a consensus to develop a regional agreement on dam safety in Central Asia. On the margins of the regional meeting, two bilateral meetings were held between Tajikistan and Uzbekistan and Kyrgyzstan and Uzbekistan. These meetings discussed the possible transboundary cooperation on safe management of dams located on transboundary rivers. The events aimed to raise awareness on the problems of safe management of dams among donor and development organizations, deepen and expand cooperation in the area and mobilize additional support. The result was the organization, with financial support from the OSCE, GIZ and the Slovak Vodohospodarska vystavba, s.o.e., of a one-week training seminar for 20 Central Asian dam and water management experts in the Slovak Republic.

Water quality in Central Asia. Within the framework of the "Water Quality in Central Asia" [project](#), a [meeting](#) of the Working Group on Water Quality was held to finalize the mandate of RWG-WQ⁵⁴, and develop and agree upon the Group's [Work Plan](#) for 2019-2020 (5 February, Tashkent).

Facilitating the work of EECCA NWO. SIC ICWC with support of UNECE held the International Conference of EECCA NWO "Science and Innovations for Water Security" (23-24 September, Yekaterinburg), (see Section "[INBO](#)").

SPECA Program. Together with UNESCAP, UNECE leads the United Nations Special Program for the Economies of Central Asia (SPECA) promoting economic cooperation among the seven parti-

cipating countries of the Program (see Section "[Economic and Social Commission for Asia and the Pacific](#)"). ECE coordinated the [23rd Session](#) of the Working Group on Water, Energy and Environment, the main objectives of which were to finalize and agree on its draft Terms of Reference and to discuss the Concept of the SPECA Strategy on Water, Energy and Environment (2 October, Tashkent). The Terms of Reference adopted by the Group were subsequently endorsed by the 14th Session of the SPECA Governing Council (21 November, Ashgabat).

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.

IWAC Activities in 2019

Events held at the IWAC Office:

- first meeting of the Working Group on Kazakhstan's chairmanship at the Bureau of the Water Convention, which discussed issues of the 28th meeting of the Bureau (27-28 February) and the IWAC Program of Work for 2019 ([25 February](#));
- meeting of the IWAC Director Mr. S. Akhmetov with Mr. Guy Bonvin, Special Envoy for Water for Central Asia of SDC to discuss opportunities for developing cooperation under the Blue Peace joint dialogue in Central Asia and the IWAC project on creating a youth network for water sector professionals ([12 March](#)).

Within the framework of the XII Astana Economic Forum, IWAC jointly with the Ministry of Agriculture of the Republic of Kazakhstan, SDC, WB and the EU Delegation in Kazakhstan held a high-level panel session "*Water as a factor of economic growth and security in Central Asia*" ([17 May](#)). During the panel session, national needs and views on sustainable water management at the regional level were discussed; the possibilities of creating an international water and energy consortium in Central Asia were considered.

⁵⁴ Regional Working Group on Water Quality

The state-owned Slovak Vodohospodarska vystavba, s. o. e. held a [training seminar](#) on ensuring the safety of hydraulic structures in cooperation with UNECE and IWAC. The purpose of the seminar was to familiarize specialists from

Central Asian countries with the Slovak experience in managing hydraulic structures (October 7-11, Bratislava, Slovak Republic).

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.

SPECA Program. ESCAP in cooperation with UNECE manages SPECA. In 2019 under SPECA, the following events were organized: [23rd Session](#) of the Working Group on Water, Energy and Environment (2 October, Tashkent; see Section "[UN Economic Commission for Europe](#)"); [SPECA Economic forum](#) "Connectivity: Sustainable



Transport and Trade Facilitation in the SPECA Subregion" (20-21 November, Ashgabat); [14th Session](#) of the SPECA Governing Council, which adopted the [Ashgabat Initiative](#) on reducing barriers to trade and transport using United Nations legal instruments, norms, standards and recommendations while bolstering connectivity in the SPECA region; received [progress reports on the activities of the SPECA Thematic Working Groups](#); adopted the [SPECA Innovation Strategy For Sustainable Development](#); approved the [SPECA Work Plan](#) for 2020-2021; elected Kyrgyzstan to chair the Program in 2020 (21 November, Ashgabat).

Sources: www.unescap.org, www.unece.org

6.8. United Nations Regional Centre for Preventive Diplomacy for Central Asia

The United Nations Regional Centre for Preventive Diplomacy for Central Asia (UNRCCA) was established on the initiative of the five Governments of Central Asia 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.

In 2010, UNRCCA launched its water project to support five CA countries in their search for mutually acceptable water agreements. Particularly, UNRCCA promotes dialogues between the Central Asia states on transboundary water resource management and supports initiatives aimed at solving water, environmental and



other problems influencing the situation in the Aral Sea basin. UNRCCA assists the Governments of the region in the development of a comprehensive mechanism for the effective use of water and energy resources, on the basis of recognized norms of international law, and taking into consideration the interests and needs of all states. It supports the governments in capacity building for water diplomacy by developing the skills and raising the awareness of civil servants in Central Asia and Afghanistan. The Centre focuses on collecting and sharing data for early warning and on hazards related to glacier melt and climate change, and on identifying the needs of countries in this area.

UNRCCA Activities in 2019

In 2019, building on new approaches in the context of growing water scarcity and global climate change and taking into account the Agenda 2030, the Center developed a new three-year project to support regional transboundary water cooperation for 2019-2021. The project focuses on the following main areas arising from the preventive mandate of UNRCCA: (1) using preventive and water diplomacy to build confidence; (2) strengthening relevant institutions and legal base in the region; (3) enhancing transparency, cooperation and partnership.

Within the framework of the water project, the Center continues to organize training seminars and meetings of national experts from Central Asia and Afghanistan, which help to raise awareness of participants, establish contacts, contribute to understanding of key problems and existing benefits of cooperation.

Representatives of relevant ministries and institutions from the countries of Central Asia and Afghanistan, as well as national and international experts gathered in Almaty [to discuss](#) issues of water cooperation (June 18-19). The meeting was organized by UNRCCA within the framework of its mandate to promote water dialogue in the region through preventive diplomacy. The event consisted of two parts. On the first day, a training seminar on gender equality in water management was held through the lens of best practices and international standards in human rights. The second day of the meeting was devoted to discussions of issues relating to existing agreements between the countries of the region in transboundary water cooperation. Meeting participants also reviewed the institutional and legal framework for water cooperation, as well as competing needs for promoting regional dialogue in this field.

UNRCCA co-organized the second Central Asian Expert Forum with the Kazakh Institute for Strategic Studies under the President of the Republic of Kazakhstan and the Friedrich-Ebert-Stiftung in Central Asia (5-6 September, Nur-Sultan and Burabay). This year's theme was "Dialogue on Water Issues in Central Asia: From the National to the Regional Levels". Participants focused on key issues of ensuring regional cooperation aimed at addressing issues of water, energy, ecology and tourism in Central Asia. They also discussed ways to improve cross-border water management and mitigate the consequences of the desiccation of the Aral Sea to arrive at common strategies to generate new initiatives and promising ideas for the

Governments of the Central Asian states in these areas.

Special Representative of the Secretary-General (SRSG) Natalia Gherman expressed the readiness of UNRCCA to continue to support the regional initiatives and endeavors of all of the countries of Central Asia to consolidate regional peace and security through enhanced cooperation and building trust.

SRSG Natalia Gherman [represented](#) the UN Secretary-General at the High-Level International Conference "Aral Sea Region – Zone of Environmental Innovations and Technologies", convened by the Government of Uzbekistan under the aegis of UN (24-25 October, Nukus). SRSG Natalia Gherman underscored the UN's constant attention to the environmental problems of the Aral Sea, and the personal engagement of the UN Secretary-General in mobilizing the international community's potential to help overcome the negative consequences extending far beyond the Aral Sea basin.

UNRCCA [organized a capacity building workshop](#) on water diplomacy practices related to disputes over water resources in the context of the "Water, Peace and Security" agenda (12 November, Dushanbe). Representatives of relevant ministries and institutions of the Central Asian countries and Afghanistan participated, along with UN agencies, partner organizations and independent experts. During the workshop, participants reviewed water diplomacy best practices and international experience related to disputes over transboundary water resources. They also discussed practical ways of benefiting from challenges and opportunities that may arise from such disputes as well as from cooperation more broadly. The workshop also provided participants with a brief overview of regional and international legal instruments and institutions that provide a framework for using transboundary waters in Central Asia. Building upon this, participants also considered possible options for improving the effectiveness of the existing framework.

UNRCCA [convened a regional capacity-building workshop](#) dedicated to water cooperation in the Central Asian region (17-18 December, Ashgabat). The event was attended by the representatives of the ministries and state agencies of the countries of Central Asia and Afghanistan, international and partner organizations as well as international experts. During

the workshop, participants had an opportunity to learn more about and discuss the new innovative technologies in the rational use of water and energy resources aimed at deepening mutually beneficial cooperation between the states. In particular, they reviewed international experience, displaying concrete examples and cases how various water-saving technologies helped countries to overcome differences and arrive at mutually beneficial solutions. The delegations also exchanged their best practices at the national level and discussed ways of possible cooperation.

Back-to-back with the workshop a meeting of Central Asian experts on water, energy and

environment was held. There was meaningful exchange of views among the participants on topical streams of regional cooperation in the given areas, as well as on potential spheres of work for 2020.

In cooperation with SIC ICWC, four early warning bulletins were published with information on current and forecast situation in the Syr Darya and Amu Darya river basins in 2019, as well as the **second edition** of the [Water Year-book](#): Central Asia and around the Globe, which features key water-related events and developments in Central Asia and beyond in 2018.

Source: <https://unrcca.unmissions.org>

6.9. World Meteorological Organization

The World Meteorological Organization (WMO) 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.

The 18th World Meteorological [Congress](#) was held, where a decision was made to overhaul the WMO [governance structure](#); a new WMO strategic plan to achieve its vision by 2030 and WMO's regular budget for the four-year period 2020-2023 were approved; the WMO President, along with other office holders and members of the Executive Committee were elected (3-4 June, Geneva). The



World Meteorological Congress approved a resolution on the [WMO Catalogue for Climate Data](#), bringing to fruition four years of work by the WMO Commission for Climatology. An initial 18 global climate datasets have been so far submitted by international domain Subject Matter Experts (SMEs) and assessed.

Events organized: top-level [meetings](#) in Washington (April); [first](#) World Meteorological Centers Workshop (April); [second](#) Multi-Hazard Early Warning Conference (MHEWC-II) (May); [activities](#) during the Latin America and Caribbean Climate Week (August); High Mountain [Summit](#) (29-30 October); [fourth session](#) of the Arctic Climate Forum via video-conference (30 October).

Documents concluded: [action plan](#) with WB to scale up collaboration; [agreement](#) with World Ocean Council; Framework [Memorandum](#) of Understanding with GWP on strategic collaboration to achieve the objectives of IWRM; together with the secretariat of UNFCCC [agreements](#) with the Global Energy Interconnection Development and Cooperation Organization (GEIDCO) on cooperation.

WMO projects in CA and Afghanistan

[Afghanistan Early Warning System](#) (US \$2,4 million); [Central Asia Region Flash Flood Guidance \(CARFFG\) System](#); Severe Weather Forecasting Demonstration [Project](#) for the Central Asia (SWFDP-CA) with support of the World Bank; Uzbekistan [Climate Data Restoration](#) (as of February 2020, Uzhydromet has converted over 7 million pages of hydrometeorological observations into digital images and this operation is on track to complete this first phase of data rescue by the end of 2020).

WMO publications

WMO Bulletins [Vol. 68\(1\)](#) – WMO for the 21st Century and [Vol. 68\(2\)](#) – Realizing the WMO 2030 Vision; [Gendered impacts of weather and climate: evidence from Asia, Pacific and Africa](#); 2019 WMO [Statement](#) on the State of the Global Climate; [WMO report on The Global Climate in 2015-2019](#); 2019 [State](#) of Climate Services.

Other WMO publications are available on: <https://library.wmo.int/>

Source: <https://public.wmo.int/en>

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.

Uzbekistan

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 dekhani farmers, rural women and youth. The 2019 ongoing projects include [Dairy Value Chains Development Program](#) and [Agriculture Diversification and Modernization](#).

Tajikistan

IFAD has been investing in the rural poor in Tajikistan by strengthening local institutions and grassroots organizations, and expanding their access to land, productive technologies and resources. Key activities include: natural resour-

ce management; implementing land reforms; and strengthening local institutions and grassroots organizations. The 2019 ongoing projects include [Community-Based Agricultural Support](#) and [Livestock and Pasture Development](#).

Kyrgyzstan

Up to present, IFAD has provided US \$97.8 million in financing projects to improve livestock productivity; enhance climate resilience of pastoral communities; and improve integration of smallholder livestock farmers into remunerative markets. The 2019 ongoing projects include [Access to Markets](#) and [Livestock and Market Development Program II](#).

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.

On 18-20 February, UNESCO-IHP and UNECE [organized a workshop in Istanbul](#) on Water Cooperation in the context of SDG 6 indicators 6.5.2 (Water Cooperation) and 6.5.1 (Integrated Water Resources Management, IWRM), hosted by the Turkish Water Institute (SUEN). The main objective of the meeting was to give the opportunity to participants from countries mainly located in the Mediterranean, Caucasus and Central Asia regions to receive information about the results of the first reporting cycle of indicators 6.5.2 and 6.5.1 and discuss the next steps to be taken in preparation of the next monitoring cycle of the two indicators.

On 13-14 May, the [UNESCO International Water Conference](#): Leveraging Intersectorality for Sustainable Water Security and Peace was held in Paris.

On 1 October, [the 58th Session](#) of the IHP Bureau was held, where the participants [discussed](#) further strengthening IHP's delivery on water security in support of the countries implementing the Agenda 2030 and SDGs.

At the UNFCCC **COP 25** in Madrid, Spain, the Intergovernmental Hydrological Programme, UNESCO Water and its partners [organized](#)

[events](#) to foster water security for climate action and sustainable development, including sessions “City-level capacity-building for resilience” and “City-level capacity-building for climate action” and side events “Water Management within Climate Informed Decision-making to Support UNFCCC and SDGs”, “Climate-resilient Water Management Approaches”, and “Mountains, Glaciers and Snow”.

Activities of the UNESCO Cluster Office in Almaty

On 13-14 March, the UNESCO [Regional Workshop](#) on mobilization of youth and young professionals in science for disaster risk reduction (DRR) in Central Asia took place. Participants made recommendations to UNESCO to further expand scientific research in practice for DRR, establish a network of young experts in DRR in Central Asia, and improve science communication and media coverage of DRR. The workshop also resulted in establishment of the [Disaster and Climate Resilience Youth Network](#) (DACRYN).

In April, the UNESCO Cluster Office in Almaty, together with partners, conducted a series of consultations with vulnerable local communities living in areas at risk for glacial lake outburst, including Issyk and Talgar cities (Kazakhstan), Pskem and Tepar villages (Uzbekistan), Tosh-Bulak and Yurievka villages (Kyrgyzstan), and Shugnan district of Gorno-Badakhshan Autonomous region (Tajikistan). The consultations were aimed at assessing vulnerability of local communities to the impacts of climate change, as well as raising awareness about adaptation. The activities were organized as part of the preparation of a regional project proposal on breakthrough lakes.

On 17-18 May, Kazakh-German University [hosted the workshop](#) “Integrated Water Resources Management Master Program Retreat”. The UNESCO session “Cooperation in Education

and Science in Central Asia” showed the experience of the work of UNESCO Centers and Chairs in Central Asia. At this session the way of how the UNESCO Chair and Institutes in Central Asia can help to develop and straiten the water related science and education was discussed.

On 24-26 July, the UNESCO Cluster Office in Almaty, in cooperation with the International Hydrological Program (IHP) and in coordination with the UNDP Istanbul Regional Hub, [organized a meeting](#) to develop activities related to climate change impacts on melting glaciers, and particularly to strengthen the resilience by reducing vulnerabilities of Central Asian countries in response to glaciers melting. The meeting provided an opportunity to develop more synergies between the two projects, understanding among the participants on the rationale of the two projects, discuss the needs and gaps on the topic of the project.

On 2-10 September, the first in Central Asia expedition “[Adventure of Science: Women and glaciers in Central Asia](#)” was held by the Fribourg University with support of SDC and in close collaboration with the UNESCO Cluster Office in Almaty. It brought 15 women from the Central Asian states for a trip to Golubin glacier in the Ala Archa, Kyrgyzstan to inspire young women pursuing their careers in research. The team discovered the nature around them, trained their mountaineering skills and documented their observations with art works.

On 3 December, the UNESCO Cluster Office in Almaty [held a meeting](#) on the creation and implementation of cryosphere training modules in the universities of the Central Asian region with the participation of representatives of universities and research institutes of Central Asia. It was proposed to create a training module on the cryosphere at the Master's level, as well as identify partner institutions to establish a UNESCO Chair in this area.

Sources: en.unesco.kz; www.unesco.org

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.



FAO Activities in the Central Asian States in 2019

Kazakhstan

FAO assistance in Kazakhstan [is shaped](#) by the FAO Country Programming Framework (CPF). Consultation and drafting of a new CPF for 2019-2021 are underway. As of May 2019, FAO has been implementing 8 national and regional projects for a total of US \$3.1 million. The prospective portfolio includes 17 different projects with confirmed funding for a total of US \$12.2 million.

Current Activities/Projects

Agriculture and forest management. The FAO [project](#) "Support to Development of Organic Farming and Institutional Capacity Building in Kazakhstan" is now working to strengthen capacities in the sector through improved legislation, institution building and strategic planning. FAO [has provided technical assistance](#) to the Forestry and Hunting Committee, operating under Kazakhstan's Ministry of Environment, Geology, and Natural Resources, for developing the National Forestry Programme and Action Plan; [Supporting the Nationalization of SDGs](#) (2018-2020, US \$95 thousand).

Food security. Kazakhstan has strengthened its commitment to improving the safety of raw milk and dairy products with the signing of [a road-map](#) that will bring the national dairy industry to the level of the EAEU standards.

Phytosanitary control. Within the framework of the FAO project "Support for Locust Control in Kazakhstan", an international FAO locust control expert started his work in Zhambyl and Turkestan regions on the 4th of May. In 2019-2021, within the framework of a regional project to strengthen locust control in the Caucasus and Central Asia, a number of activities will be organized in Kazakhstan to train relevant field services, strengthen coordination with neighboring countries, and improve phytosanitary control legislation. The Ministry of Agriculture of Kazakhstan is considering two FAO locust control projects with financial support from Japan and USAID worth US \$1.2 million.

Planned projects. CPF Formulation (2021-2025) and preparation of the project proposals for the FAO-Kuwait Partnership Program (2020-2021, US \$86,000); Promotion and Exchange of Good Practices on the Use of Digital Technologies in Agriculture for Further Up-Scaling (2020-2021, US \$300,000).

Kyrgyzstan

As at the end of 2019, the FAO Representation in Kyrgyzstan is implementing 34 country and regional projects on fishery, crop, forestry, livestock, food security and nutrition development, rehabilitation of degraded pastures, forests and agricultural lands, and promotion of organic agriculture, worth over US \$11 million. FAO's assistance in Kyrgyzstan is shaped by the 2018-2022 FAO's CPF.

Current Activities/Projects

Forest and land management in the context of climate change. Under the joint GEF project "[Sustainable Management of Mountainous Forest and Land Resources under Climate Change Conditions](#)" (2015-2019, US \$5.5 million), Kyrgyzstan is developing the "Strategy for Mitigation of Climate Change in the Land Use, Land-Use Change and Forestry" and the National Carbon Monitoring System. The Government of Kyrgyzstan approved the Concept of Forestry Development for the Period up to 2040 developed with FAO support (27 May). Implementation of the "[Participatory Assessment of Land Degradation and Sustainable Land Management in Grassland and Pastoral Systems](#)" project is ongoing (2017-2019).

Agriculture, fisheries and aquaculture development. The following projects are implemented: [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 (2019-2021, US \$500,000); [Towards Sustainable Aquaculture and Fisheries Development in the Kyrgyz Republic 2009-2020](#) (funded by the Finnish Ministry for Foreign Affairs, US \$2.5 million); [Support to Sustainable Rural and Peri-urban Family Poultry Development](#) (2019-2021, US \$339,000).

Food security. The FAO-EU "Food and Nutrition Security Impact, Resilience, Sustainability and Transformation" (FIRST) Program is contributing to [building capacities](#) and preparing a new National Food Security and Nutrition Program for 2018-2022.

Gender. The "[Accelerating Progress towards the Economic Empowerment of Rural Women \(RWEE\) in the Kyrgyz Republic](#)" project was continued (2014-2020, US \$1.1 million).

Other relevant projects. Technical Support in Project Component Formulation on Value Chain Development (2019-2020, US \$29,000); Support in Improving the System of Calculation of Producer Price Indices (PPI) in Agriculture and related SDG Indicators (2019-2020, US \$66,000); Strengthening Capacities for Disaster Risk Reduction and Disaster Preparedness in the Agricultural Sector (2018-2020, US \$363,000).

Planned project. Enhancing Capacity for Food Safety Management in the Kyrgyz Fruit and Vegetable Industry (2020-2022, US \$570,000).

Tajikistan

[FAO's assistance](#) in Tajikistan is shaped by the 2019-2021 FAO's CPF.

Current Activities/Projects

Agriculture, organic agriculture, and food security. The following projects are implemented: [Strengthening Institutions and Capacity of the Ministry of Agriculture & State Veterinary Inspection Service for Policy Formulation](#) (2016-2020, US \$5.7 million), which supported implementation of Tajikistan's Agrarian Reform Program and institutional development and capacity strengthening of the Ministry of Agriculture in relevant areas of policy-making, financial and policy analysis, disease surveillance and data management; [Improvement of Legal Framework and Institutional Capacity to Promote Organic Agriculture](#) (2019-2021, US \$95,000); [Improving Capacity and Monitoring System of GMO](#) (2019-2020, US \$93,000); [Enabling Market Access for Tajik Agricultural Products through Improved Food Safety System](#) (2018-2021, US \$197,000); [Capacity Development to Estimate Crop Water Requirements in a Context of Climate Change](#) (2019-2020, US \$250,000).

SDGs. [Support to SDG Implementation, Monitoring and Reporting](#) (2019-2020, US \$70,000).

Planned projects. Support to Improved Agricultural Mechanization Services (2020-2021, US \$250,000); Strengthening the Resilience to Climate Change through Applying Solar Powered Water Systems (2020-2021, US \$92,000); Support to Institutionalization Methodology for Assessment of Damage and Loss in Agriculture (2020, US \$68,000); Biodiversity Conservation for Adaptation and Sustainable Use of Natural Resources (2020, US \$50,000).

FAO established a [pilot agrometeorological network](#) of three automatic agrometeorology

stations in Tajikistan, with support from the European Union and in close collaboration with the Agency for Hydrometeorology of Tajikistan's Committee for Environmental Protection. The aim of the new network is to introduce weather data collection and analysis methods to provide early warning to farmers on climate, plant diseases and yield forecasting.

Turkmenistan

FAO interventions and resource mobilization for Turkmenistan envisages three priority areas: (1) agricultural production and food security, with a view to increasing the contribution of agriculture, forestry and fisheries to the country's economic growth; (2) sustainable natural resource management, climate change mitigation and adaptation; (3) increased resilience of rural livelihoods to agriculture and food security threats and shocks. FAO has no official representation in the country.

In 2019, the [regional project](#) of the Ministry of Agriculture and Environmental Protection of Turkmenistan and the Michael Zukkov Foundation (Germany) launched the Central Asian Desert Initiative (CADI) – Conservation and Sustainable Use of Turkmenistan Deserts. Starting in the spring of 2019, four joint scientific field expeditions to the Bereketli Garagum and Repetek nature reserves were carried out, as well as the dry subtropical deserts of Priatrechye and the Caspian region were studied to learn the components of biodiversity (botanical and zoological field expeditions). Based on the results of field expeditions, national scientific experts prepared and presented reports that are the basic information in preparing the nomination dossier for nominating the desert ecosystems of the temperate zone to the UNESCO World Heritage List. A seminar was held with the participation of international experts on assessing the management effectiveness of the Bereketli Garagum Reserve. A report was prepared on the use of the monitoring tool for management effectiveness in the Bereketli Garagum nature reserve. The existing potential of the Bereketli Garagum and Repeteksky reserves for creating information visit centers on their basis was also determined.

Uzbekistan

In January 2019, FAO and Uzbekistan [have signed](#) a Country Programming Framework document giving impetus and further guidance to their partnership through 2022.

Current Activities/Projects

Forest management. Sustainable Management of Forests in Mountain and Valley Areas in Uzbekistan (2018-2023, US \$3.2 million) to implement sustainable forest management in Uzbekistan by sequestering carbon and improving the quality of forests and tree resources.

Agriculture, fisheries, and aquaculture. National Review and Strategy for Aquaculture Sector and Fish Value Chain (2019-2021, US \$255,000); Support to Sustainable Apiculture Development (2019-2021, US \$345,000).

SDGs. Strengthening National Capacities in SDG Implementation and Monitoring (2019-2020, US \$95,000).

Gender. FAO experts provided [an assessment](#) of the gender, agriculture and rural development in Uzbekistan.

Planned project. Sustainable Forest and Rangelands Management in the Dryland Ecosystems of Uzbekistan (2020, US \$150,000).

The [Regional Conference for Europe and Central Asia](#) will be hosted by Uzbekistan in early 2020. As many as 300 delegates from the Europe and Central Asia region, including high-level country officials and representatives of partner organizations, are expected to visit Tashkent. It is the highest regional decision-making body for FAO, and what is decided there will shape FAO's work towards sustainable food and agriculture in 2020–2021 and beyond.

FAO Regional Projects

- The “Integrated Natural Resources Management in Drought-Prone and Salt-Affected Agricultural Production Landscapes in Central Asia and Turkey project” is the second phase of the Central Asian Countries Initiative on Land Management ([CACILM-2](#)) regional program, with a budget of over US \$75 million.

With support of the Ministry of Agriculture of Kazakhstan, demo sites were selected in five regions of Kazakhstan and field works began on demonstration of salt- and drought-tolerant crops, conservation technologies, practices for soil reclamation, as well as on the production of fodder and forage crops, management and restoration of rangeland resources.

In Kyrgyzstan, FAO in partnership with the non-governmental organization Camp Ala-Too is actively working on strengthening knowledge and capacities of rural communities in Naryn Oblast on sustainable pasture management.

In four districts of Tajikistan, initiative groups of women farmers have been formed. They have already begun cultivating salt-tolerant crops in their farms. The groups are designed to disseminate sustainable and climate-friendly land use technologies through Farmer Field Schools.

About forty varieties of drought and salt tolerant crops – plants and trees – were planted at demonstration sites in four regions of Uzbekistan using various field technologies. Already 100 farms in the target districts, the heads of which were trained under the project, have begun cultivating drought- and salt-tolerant crop varieties such as corn, African pearl millet, black cumin, sugar sorghum, flax and many others using hydrogel and conservation tillage methods including zero tillage.

In partnership with the Government of Uzbekistan, the project contributes to the implementation of the “Million Fruit Trees” program by arranging the planting of drought-tolerant trees on the dry bottom of the Aral Sea and other semi-desert regions.

- [Central Asian Desert Initiative](#) (CADI). Second meeting of the Coordination Committee (Nur-Sultan) and [workshop](#) of the Intergovernmental Platform on Biodiversity and Ecosystem Services (Ashgabat) were held;

- [Lifecycle Management of Pesticides and Disposal of POPs Pesticides in Central Asian Countries and Turkey](#) with support of GEF. Workshops were organized in [Kyrgyzstan](#) and Tajikistan;

- [Developing Capacity for Strengthening Food Security and Nutrition](#);

- The [Program to Improve National and Regional Locust Management in Caucasus and Central Asia](#) to reduce occurrence and intensity of locust outbreaks in CCA, thus limiting threat or damage to crops and rangelands and safeguarding rural population food security and livelihoods, as well as minimizing impact of chemical control operations on human health and the environment. 12-day regional trainings (from 9 March, Tbilisi) and annual technical workshop (13-15 November, Tashkent) were held;

- A new FAO “Support in the Preparation of National Strategies to Promote the Export of Selected Agricultural Products in Azerbaijan, Tajikistan and Uzbekistan” project [was launched](#) (13 March, Tashkent).

Source: www.fao.org

6.13. United Nations Environment Program

The United Nations Environment Program (UNEP) was founded in 1972 by the General Assembly Resolution No 2997 of 15 December 1972. UNEP is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. Under the auspices of UNEP, World Environment Day is celebrated every year on 5th of June since its proclamation in 1974 to focus the world's attention to environmental issues.



Cooperation with the Central Asian States

In March 2015, the UNEP Almaty Office for Central Asia was opened. Ms. Aidai Kurmanova is the Head of UNEP Sub-Regional Office for Central Asia.

Cooperation with countries builds on **multi-lateral environmental agreements**. UNEP serves as the Secretariat for the following conventions: Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention); Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants; UN Framework Convention on Climate Change; Convention on Biological Diversity; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Convention on the Conservation of Migratory Species of Wild Animals; Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer.

In 2018, the UNGA adopted **two resolutions** that form a framework for enhanced cooperation with countries in the region:

- [A/RES/72/273](#) adopted on 12 April 2018 – Cooperation between the United Nations and the International Fund for Saving the Aral Sea;
- [A/RES/72/283](#) adopted on 22 June 2018 – Strengthening regional and international cooperation to ensure peace, stability and sustainable development in the Central Asian region.

A Memorandum of Understanding was signed between UNEP and ICSD in 2017. UNEP supports ICSD in implementing the Regional Environmental Program for Sustainable Development in Central Asia until 2030 (REP4SD-CA), which is aimed at establishing effective mechanisms for regional cooperation on effective environment protection in the region, sustainable socio-economic development, as well as conservation and rational use of natural resources. Among the priorities of REP4SD-CA are: (1) environment-related SDGs; (2) climate change adaptation and mitigation; (3) green economy; (4) UN environmental conventions and related international obligations of countries; (5) legal and institutional regulation of ICSD and its structures.

UNEP projects and activities in 2019:

On 22 January, the results of the Environmental Transparency [Rating](#) of Kazakhstan Oil and Gas Companies were presented in Astana. The project is implemented by the World Wildlife Fund (WWF) with the support of UNEP and Ministry of Energy of the Republic of Kazakhstan. The rating was based on comparable information about the environmental transparency level of 19 companies and the extent of their environmental impact.

On 25-26 January, together with the Ministry of National Economy of Kazakhstan, a training ses-

sion was held in Astana for middle- and senior-level staff of government agencies on SDGs integration into strategic planning systems.

On 19-20 March, a regional workshop for Central, Eastern European and Central Asian countries was organized in Almaty to launch the [project](#) "Promoting Regulatory and Voluntary Action by Government and Industry to Phase out Lead in Paint".

On July 3-5, the Green Energy & Waste Recycling Forum 2019 was held in Nur-Sultan. The Fo-



Forum is an important event in Central Asia. This was the 4th edition of the Forum, which brought together representatives of government agencies, international organizations and industry professionals working in the field of energy and waste management, who shared their ideas, international experience and best technologies for clean energy, recycling and disposal of industrial and domestic wastes. The session on plastic pollution presented the results of the UNEP global campaign "[Beat Plastic Pollution](#)", as well as recommendations of the "Single-Use Plastics: a Roadmap for Sustainability" [report](#).

On 24 October, a regional meeting of ICSD was held in Nukus. UNEP assisted the Uzbek State Committee on Ecology and Environmental Protection in organizing an event, where representatives of ICSD from the Central Asian countries approved the draft REP4SD-CA until 2030. The meeting also celebrated the 25th anniversary of ICSD and passed the chairmanship to Uzbekistan for the next two years.

On 21-22 November, a workshop was held together with the Kazakh Statistics Committee in Astana to improve national environmental statistics for monitoring progress towards SDGs.

On 25-27 November, a workshop was held jointly with UNDP, UNECE and the Turkmen State Committee on Statistics in Ashgabat to improve national capacities in collection and analysis of environmental statistics for monitoring progress towards SDGs.

The Russia-funded project "Capacity Development and Technology Transfer to Improve the Generation and Use of Data and Information in Support of Monitoring the Environment in Central Asia" has been launched, under which three countries of the region will have access to full land cover and land use categorization and mapping of their respective territories, including

terrestrial and aquatic ecosystems and information from existing monitoring networks. This information will inform national State of Environment Reports, sustainable management of natural resources, address transboundary environmental issues, as well as reporting to the SDGs and major multilateral environmental agreements. A digital atlas of the environment will be developed and produced, will allow the analysis and assessment of environmental change in the key domains of water, land, and biodiversity and will lead to the production of data flows, development of indicators, generation of statistics and production of pilot water and land accounts. The first national multi-stakeholder consultations were held to launch the project (11-12 December, Dushanbe).

National consultation workshops also were held to launch the "[Vanishing Treasures](#)" project, which aims to preserve the population of snow leopards in Central Asia and improve the adaptive capacity of mountain ecosystems to climate change (Bishkek, Dushanbe).

The GEF [project](#) on chemicals and waste management "Demonstration of Non-thermal Treatment of DDT Wastes in Central Asia" was started in Kyrgyzstan and Tajikistan.

At the beginning of the year, the first [PAGE](#) (Partnership for Action on Green Economy) experts' mission to Kazakhstan took place for bilateral meetings with relevant ministries and organizations to develop a Roadmap and agree on the Work Plan. PAGE represents a mechanism to coordinate actions of five UN organizations (UNEP, ILO, UNDP, UN Industrial Development Organization (UNIDO), and UN Institute for Training and Research (UNITAR)) launched in 2013 as a response to the call at Rio+20 to support those countries wishing to embark on greener and more inclusive growth trajectories. Kazakhstan joined PAGE in 2018 with the overall

objective of diversifying economy and achieving the ambitious targets set out in its National Development Strategy Kazakhstan 2050 and its Green Economy Concept. At the sectoral level, Kazakhstan aspires to become a regional hub

for green finance, which would provide further support for the investments in Kazakhstan's green economy.

Source: UNEP Almaty Office for Central Asia

6.14. 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.

At the 71st Session of the Commission, reports were presented on the following items: Crimes against humanity; 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; immunity of State officials from foreign criminal jurisdiction; general principles of law; sea-level rise

in relation to international law. The Commission decided to include in its long-term program of work the topics: (1) reparation to individuals for gross violations of international human rights law and serious violations of international humanitarian law; (2) prevention and repression of piracy and armed robbery at sea.

With respect to the topic "Protection of the environment in relation to armed conflicts", the Commission had before it the second report of the Special Rapporteur ([A/CN.4/728](#)), which discussed questions related to the protection of the environment in non-international armed conflicts, and matters related to responsibility and liability for environmental damage.

Source: ILC report at its 71st Session, 2019, <https://undocs.org/en/A/74/10>

6.15. 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 2019, the Court's list of cases included only one case directly related to water.

Dispute over the Status and Use of the Waters of the Silala (Chile v. Bolivia)

On 6 June 2016, the Republic of Chile filed an Application instituting proceedings against the Plurinational State of Bolivia with regard to a dispute concerning the status and use of the waters of the Silala. For the nature of the case

and proceedings in 2016-2018, see the Yearbook editions for [2017](#) and [2018](#). By an Order dated 15 November 2018, the Court directed the submission of a Reply by Chile and a Rejoinder by the Plurinational State of Bolivia, limited to the Respondent's counter-claims, and fixed 15 February 2019 and 15 May 2019 as the respective time-limits for the filing of those written pleadings. By a letter dated 4 June 2019, the Agent of Chile informed the Court that her Government wished to avail itself of the right to present an additional pleading on the counter-claims. By a letter dated 7 June 2019, the Agent of the Plurinational State of Bolivia stated that his Government had no objection to that request. By an Order dated 18 June 2019, the Court authorized the submission by Chile of an additional pleading relating solely to the counter-claims of the Plurinational State of Bolivia and fixed 18 September 2019 as the time-limit for the filing of that pleading.

Source: ICJ report at the 74th Session of UNGA, 2019 ([A/74/4](#))





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. As of October 2019, AWC is composed of 137 organizations from 36 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 Asian International Water Week (AIWW).

Activities in 2019

On 14-16 March, Manila, the Philippines, hosted the AWC's [3rd General Assembly](#) and the 8th and 9th meetings of the Board of Council. The General Assembly approved amendments to the AWC Constitution, adopted the three-year work plan for the period of 2019-2021, and elected the new Board of Council for 2019-2021. One of the 26 newly elected members of the Board is the head of the [GEF Agency of IFAS](#), the only organization from Central Asia – an active member of the Council to date. The General Assembly also approved the 2nd [Asian International Water Week](#) in Bali, Indonesia, in October 2020. The theme of the week is "Better for Water - Better for Life". The 2nd AIWW will address such issues as security and sustainable growth; water management policies and technologies to meet the requirements of a changing climate;

water-energy-food-environment nexus; water security; pilot projects on smart technologies and capacity building, etc.

On 15 March, a special session was held under the umbrella of the AWC Advisory Council of National Parliaments in Asia (ACNPA) to promote the legal framework needed for solution of key water problems in Asia. Representatives of the parliaments of Indonesia, Korea, Pakistan, the Philippines and the leadership of AWC signed declaration on the establishment of the Advisory Council of National Parliaments in Asia. The Declaration is open for accession by all Asian parliaments.

The 10th meeting of the Board of Council was held on 23-24 September in Wuhan, China, with some 60 people from 37 institutions. The Board considered the matters related to financing, activity reports of AWC members and approved the Water Project Plan for 2020. It was decided that US \$2 million allocated by GCF for 2020 will be directed for 10 projects.

Source: Information note on AWC provided by GEF Agency of IFAS

7.2. Geneva Water Hub



The Geneva Water Hub is a joint project of the Swiss Confederation (Agency for Development and Cooperation, Global Program Water Division) and the University of Geneva. The Geneva Water Hub was established 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](#) was established by some members of the Department of Public International Law and International Organization of the Faculty of Law of the University of Gene-

va in 2009. It has been a part of the Geneva Water Hub since its establishment in 2014.

Activities in 2019

International water law. On 3-4 December, the Platform for International Water Law of the Geneva Water Hub organized two events on inter-

national water law to celebrate its 10th anniversary: a roundtable entitled "Water disputes: how to prevent and solve them?" jointly organized with the Geneva Center for International Dispute Settlement and the Secretariat of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes and a Conference on "The implementa-

tion of international water law: global, regional and basin perspectives” jointly organized with the Secretariat of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

Water and philanthropy. On 11 December, the Platform for International Water Law organized a joint conference on “Water as a Public Good: Room for Philanthropy” with the Geneva Center for Philanthropy of the University of Geneva. Water is a public good with a variety of dimensions. It is an environmental, economic, social and cultural good that must be managed and protected accordingly. States, international organizations, the private sector, associations, foundations and local communities all have a role to play to protect water in times of peace as well as during and after armed conflicts. The role of non-state actors is often neglected in the management of water resources. However, codes of conduct and ethical standards, as well as commitments made in the context of SDGs and the Paris Agreement on Climate Change, highlight that they have an important part to play. This event has addressed the role of water as a source of cooperation and inclusiveness at the domestic and international levels. The following questions have been addressed: How can non-state actors contribute to the governance of water resources? How can public-private partnerships such as the UN Global Compact strengthen water protection? How can the private sector play a role as peacebuilder after an armed conflict?

A synthesis report is available here:

https://www.unige.ch/philanthropie/files/8215/7953/4773/Summary_Phil_Lunch_Water_11.12.2019.pdf

Protection of Water During and After Armed Conflicts. The Platform for International Water Law of the Geneva Water Hub completed the “[Geneva List of Principles on the Protection of Water Infrastructure](#)”. This is the first document that comprehensively covers the protection of water infrastructure during and after armed

conflicts under international law. It is addressed both to States and non-State armed groups. It enshrines both customary norms and good practices. The Geneva Principles have been presented in several international events including at the International Peace Institute in New York, the World Bank and the Environmental Law Institute in Washington DC, as well as during the Stockholm World Water Week, the Geneva Peace Week and the 33rd International Conference of the Red Cross and Red Crescent Movement.

The Global Observatory on Water and Peace.

The Geneva Water Hub officially launched the Global Observatory on Water and Peace in two international events: the 5th Arab Water Week (March 2019) and the Budapest Water Summit (October 2019).

The role of large dams in transboundary water negotiations.

In May, the Geneva Water Hub organized a roundtable on “The role of large dams in transboundary water negotiations”. It counted with representatives from governments, the private sector, researchers and engineers, international financial institutions and civil society organizations. The goal of this meeting was to identify gaps to set the agenda for future research projects and open for collaboration to other institutions in the domains of water diplomacy and water governance.

Launch of the “Water Diplomat”. Media engagement is instrumental to raise awareness on water issues. In a move to bridge the gap on hydro-political information and trigger the interest of the public and the media, the Geneva Water Hub and the world’s leading publisher on water OOSKANews jointly launched the global media platform “[The Water Diplomat](#)”, free monthly news and intelligence resource specialized in hydro-politics. This project pursues the goal of promoting access to political stakes of water management that are making news around the world.

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 86 National Water Partnerships (NWPs), with the mission to advance governance and management of water resources for sustainable and equitable development.



The completion of 2019 marks the end of the GWP 2015-2019 Strategy. The evaluation of its implementation drew broadly positive conclusions that reflect the substantial progress across a range of aspects.

Launched in the summer of 2019, the new GWP 2020-2025 Strategy identified climate and the water-related SDGs as two of the three anchor areas around which the programmatic focus of the Strategy is based. The third anchor area of the new Strategy concerns transboundary water management. This is an area of engagement where GWP has delivered significant results in some regions, e.g. Southern Africa, West Africa, Central and Eastern Europe, and the Mediterranean, while finding it harder to gain a foothold in other parts of the world where cross-border issues are equally urgent. Considering these variations, in 2019 the general programmatic approach for organizational coordination and engagement in transboundary water management was reviewed and updated based on the learning from success factors that enabled GWP to play a meaningful role in basins such as the Danube, Limpopo, Volta and Drin.

Activities in 2019

GWP's Transboundary Water portfolio in 2019 across each of four components is described below.

Component 1. Regional dialogues on transboundary waters

Central America: Collaboration with the Central America Commission for Environment and Development (CCAD) on the establishment of a transboundary water management framework for the region which has been initiated through the organization of a dialogue process to construct a cooperation agenda within this framework and the initial identification of actions by the countries of the region facilitated by a GWP organized regional workshop in Honduras.

China: Establishment of a new River Basin Partnership for the Yangtze basin which will provide a multi-stakeholder platform through which to facilitate more equal allocation of water resources and sustainable management of the basin as a whole in line with GWP's ambitions to promote IWRM throughout China.

Central Asia: Contributions to the working group on bilateral cooperation for water management between Kazakhstan and Uzbekistan in the context of an agreement on water relations between the two countries.

Mediterranean: Support to several Mediterranean countries exploring potential accession to the UNECE Water Convention, including Leba-

non, Jordan, Iraq and Tunisia, through awareness raising, capacity building and targeted discussions and clarifications on specific technical issues resulting in the establishment of inter-ministerial committees and, in the case of Iraq, ratification of the accession currently passing through Parliament.

Component 2. Cooperation for the management of transboundary water bodies

GWP facilitates cooperation at the level of specific transboundary water bodies, supporting improved management and governance. Examples of GWP's work on this component in 2019 include: completion of the Strategic Action Program for the long-term management of the **Drin Basin**, a transboundary diagnostic analysis, and the advancement of three local pilot projects as part of GWP's role as Secretariat of the formal Drin Core Group (acting as de facto joint commission for the Drin Basin management) and coordinator of key projects in the Southeast Europe basin, including large-scale GEF/UNDP Drin Project. In the **Tisza basin**, GWP supported the successful development of the Tisza River Basin Management Plan through participation in the JOINTISZA project under which GWP facilitated the stakeholder engagement processes for the project. GWP also assisted a number of African River basins in: the creation of the **Ogoue-Ntem-Nyanga-Komo river basin organization** as a strategic partner of the Economic Community of Central African States (ECCAS); the development of a project proposal on transboundary water management in the Limpopo River basin in collaboration with the Limpopo River Basin Commission (LIMCOM) and UNDP; the implementation of a series of transboundary water and energy projects identified through the Program for Infrastructure Development in Africa (PIDA) Priority Action Plan.

Component 3. SDG 6.5 targets on transboundary waters

SDG 6.5 is particularly relevant for transboundary water governance, as indicator 6.5.1 focuses on the degree of IWRM implementation at all levels, including the transboundary level. More importantly, SDG indicator 6.5.2 focuses on the proportion of transboundary basin area with an operational arrangement for water cooperation. GWP CAf in collaboration with UNECE-UNESCO and ECCAS supported 10 countries in the region to advance transboundary cooperation and improve SDG 6.5.2 monitoring through activities such as a regional workshop on accelerating progress towards SDG 6.5.2

and participation of actors from the region to the GWP facilitated pan-African International Water Law training. GWP also contributed to the SDG 6.5.2 workshop organized between Bulgaria and Romania to support the two countries in advancing on the transboundary SDG indicator in relation to their shared portion of the Danube basin.

Component 4. Transboundary water management knowledge and learning

GWP has a well-established capacity building program in Africa, Latin America and Asia. The program focuses on key subjects of international water governance, including international water law, and makes use of a combination of online and face-to-face trainings. In 2019, GWP investigated ecologic resilience of the River Black basin, a major tributary of the Yellow River,

to provide information upon which to base the annual cross-provincial water allocation plans and water-controlling schemes of the River Black's resources. It supported the Volta Basin Authority in the organization of capacity building activities on eco-system management for climate change adaptation in the six countries of the Volta Basin, as well as in the development of a consolidated action plan for ecosystem management for adaptation to climate change in the Volta Basin. A knowledge exchange visit was organized; it saw delegates from the riparian countries of the Drin Basin (Albania, Kosovo, Montenegro and North Macedonia) visit the Mekong basin to share and learn from peers working on transboundary issues and to explore applicable solutions.

Source: GWP Annual Progress Review for 2019

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, Kyrgyzstan, Tajikistan, and Uzbekistan are the members of ICID.



ICID • CIID

On 3-7 September, the [3rd World Irrigation Forum](#) (WIF3) and the 70th International Executive Council Meeting were hosted by the Commission in Bali, Indonesia. The main theme of WIF3 was "**Development for Water, Food and Nutrition Security in a Competitive Environment**". WIF3 provides an important platform for scientists, researchers, experts and professionals from private and government sectors to come together to exchange and share experiences. In total more than 1,500 participants from 60 countries, including ministers and vice ministers from 9 countries and heads, or representatives of 10 International Organizations attended the Forum. Three parallel sessions and 12 supporting events were held, including 6 international workshops: (1) Innovation of Developing the Strategy for Impact Assessment of and Adaptation to the Climate Change as the "New Normal"; (2) Historical Water Sustainability; (3) Participatory Irrigation/ Drainage Management – Transfer, Approaches and Condition for Successful PIDM; (4) Modernizing Irrigation Services for Water, Food, and Nutrition Security; (5) Improving the Water Use Efficiency and Productivity within Water Energy Food Nexus; (6) Integrated

Development of Tidal Areas – An Exchange of Expertise from Basin Perspective.

During the Opening Ceremony of WIF3, presentation of trophy by H.E. M. Basuki Hadimulyono, Minister for Public Works and Housing (PWH), Indonesia, prize money by H.E. Tian Xuebin, Vice Minister, Ministry of Water Resources of PR of China, and Er. Felix B. Reinders, President, ICID presented the World Irrigation and Drainage Prize 2019 to Prof. Dr. Chandra Madramootoo for his sustained, long standing and highly committed work in irrigation and drainage sector worldwide through education, research, planning and international project implementation.

Following speeches and discussions, the following Statements of the Forum were formulated and adopted (excerpts are given below).

Main Statements

The focus of WIF3 was to address global food security, poverty alleviation and environment protection, through sustaining economically

and socially viable irrigation and drainage development and management. We, therefore:

- recognize that the world is facing rapid population growth and urbanization, changes in land use, climate and diets, increasing droughts and floods, environmental degradation, etc.;
- reaffirm that sustainable development and management of agricultural water is a priority issue for achieving food security and poverty alleviation;
- recognize the need to achieve water security. To this end it is vital to course-correct and increase water productivity by improving agricultural water management at all levels, in particular with respect to the specific challenges facing least developed and emerging countries, in meeting SDG and maintaining rural development.

Activities in 2019

On 4 September, the **first meeting of the Working Group on Irrigation and Drainage in the States under Socio-Economic Transformation (WG-IDSST)**

was held. WG-IDSST was established in 2018 composed of representatives of Ukraine, Uzbekistan, Tajikistan, Russia, Nigeria, Sudan, Egypt, India, Pakistan, Sri-Lanka, and Japan. Among other issues, the mandate of WG-IDSST includes developing and strengthening the network among the countries of transition on the basis of establishment of monitoring and evaluation of common problems and promoting implementation of IWRM; creating database and exchanging information about changing situation in Irrigation and Drainage in these States; monitoring the ecological situation in the transition states, including problems of closed basin (Aral Sea, Lake Chad, Lake Victoria, Caspian Sea). The agenda included the Road Map to ICID Vision 2030 – Activities in the States under socioeconomic transformation, work plan based on the mandate, as well as strengthening of the network among the transition states.

ICID identifies, recognizes and maintains a record of World Heritage Irrigation Structures of archival value that are more than a century old and help understand the evolution of irrigation systems among civilizations across the world. Nineteen heritage structures were recognized by ICID in the year 2019.

Source: Mrs. Irena G. Bondarik, ICID Vice President, www.icid.org/ag_idsst.pdf

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 river basins as an essential tool for sustainable development. Basin organizations, governmental administrations in charge of water, and bi and multilateral cooperation organizations are the members of INBO.

INBO member organizations belonging to the same geographic region created 8 regional networks of INBO, including African, Latin American, Mediterranean, etc.

General Assembly

Meeting under the Marrakech International Summit on Water Security, INBO members held their General Assembly from 30 September to 3 October 2019. The Assembly gathered more than 400 registered delegates, representing the Member Organizations, water administrations or observers from 62 countries, as well as the representatives of several interested bi or multilateral organizations and International Commissions or Authorities of transboundary basins. The

Kingdom of Morocco took over the INBO presidency from Mexico. The Assembly unanimously confirmed H.E Mr. Abdelkader Amara, Minister of Equipment, Transport, Logistics and Water of the Kingdom of Morocco, as the new INBO World President until next General Assembly which will be held during 2022; members of the new World Liaison Bureau were also designated. It was reminded that INBO was awarded the “**Special Advisory Status**” under “Major Groups” by the UN Economic and Social Council (ECOSOC), and in this respect is allowed to attend all events organized in its field of competence by the UN Agencies and Programs. The Assembly was also an opportunity to present the first assessment of the implementation of the commitments of the “[Paris Pact on Water and](#)

[Adaptation to Climate Change in the Basins of Rivers, Lakes and Aquifers](#)", already signed by more than 350 organizations from all over the world on the occasion of the COP21 in Paris in December 2015.

INBO Member-Organizations reiterated their wishes of a coordinated international initiative of the bi- and multilateral donors which would focus the Official Development Aid on IWRM projects relying on the creation and strengthening of Basin Organizations and of their Basin Information Systems, especially in the context of the necessary adaptation to the effects of climatic change on water resources all over the World.

As a result of the "Peer-to-Peer Review" projects, aimed at facilitating the implementation of the Basin Management Plans of the Water Framework Directive in the 28 Member-States of the European Union, it was agreed to propose new initiatives of this kind, expanding the possibilities of involvement of the Voluntary Basin Authorities on a global scale.

The Assembly was pleased with the continuation of the work of the **"Platform of pilot Transboundary Basins for testing measures for adaptation to the effects of climate change on water resources"**, initiated in partnership by UNECE and INBO. It calls for a broad mobilization of International Commissions or Transboundary Basin Authorities from around the world to join this strategic initiative given the very short-term challenges of adaptation, especially for

the practical implementation of the commitments of the "Paris Pact".

The INBO Work Program for 2019-2021 was approved, with 7 thematic priorities that, ultimately, should ensure ubiquitous water security as a cornerstone of sustainable development.

The Assembly wished that INBO continue the thinking started in the World Water Forums, to propose its own "vision" on the evolution of water management in the coming years, and present its proposals to go to practical field actions with the prospect of the 9th Forum in Dakar in Senegal in March 2021. INBO is the part of the steering group for the Cooperation priority.

In 2019, 17th "Europe-INBO 2019" International Conference for the Implementation of the European Water Directives (17-20 June, Finland) and 7th General Assembly of the African Network of Basin Organizations (1-5 July, Tunisia) were also held.

INBO contributed to the World Bank's Report "Financing Climate Change Adaptation in Transboundary Basins: Preparing Bankable Projects" (see Section "[Publications](#)").

INBO published the new issue of "INBO Newsletter" (No. 27, May 2019) with the key highlights of Network's activity.

Source: <https://www.inbo-news.org/en>

The Eastern Europe, Caucasus, and Central Asia Network of Water Management Organizations (EECCA NWO)

EECCA NWO is one of the eighth regional networks of INBO. It was established in 2010 to exchange views, experiences, and information on various aspects of water-management activity. The Network is administered by SIC ICWC, with the support of the Government of Russian Federation and the UNECE, and Network's activities are coordinated with those of INBO.

Activities in 2019

The International Conference of EECCA NWO on the theme "Science and Innovations for Water Security" was organized and held on 23-24 September 2019 in Yekaterinburg, Russia. 40 participants from Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan, France, Finland, Columbia and the Netherlands took part in the Conference. The reso-

lution, which supported the Network's development plan for the next years, was adopted as the outcome of the Conference.

The main topics addressed at the Conference included:

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

Following the Conference, collections of scientific papers titled “Science and Innovations for Water Security” (volumes 1 and 2) and “Selected transboundary water agreements signed between European and Asian states over 1992-2019” were issued.

EECCA NWO contributed to the development of the knowledge base on the CAWater-Info portal and supported the “Atlas of water-management and environmental organizations in the EECCA countries”; e-newsletter “Water management, irrigation and environment in the EECCA countries” is prepared and distributed weekly.

Network’s members consulted their respective states on a wide circle of water-related matters (IWRM, strengthening of financial and economic mechanisms in sustainable water

management, improvement of transboundary water cooperation mechanisms) and contributed to drafting of regulatory legal acts and national strategies (e.g. Concept of water sector development in Uzbekistan until 2035, Concept of Kazakhstan’s State Program for water management until 2030, 2020 Water Code of Tajikistan). Network’s members expanded activity through joint participation in tenders and joint implementation of research projects (e.g. drafting of the 2019 Diagnostic Report on Water Resources in Central Asia by request of OECD). A regional expert platform on water security, sustainable development and future studies was initiated (see “[Central Asian Expert Platform on Water Security, Sustainable Development and Future Studies](#)”).

Source: www.eecca-water.net

7.6. International Water Resources Association and World Water Congress



International Water Resources Association (IWRA) is a global knowledge network of water experts. Since 1971, the Association has grown to become a preeminent key actor working internationally for the sustainable use and management of the world’s water resources.

In 2019, IWRA welcomed its new Executive Board (the first truly gender-balanced Board in its history). Together they developed a new strategy as a basis for IWRA’s priorities and action plans over the short, medium and long-terms.

Since 1973, IWRA holds a World Water Congress every three years in various locations around the world. In 2019, the Association undertook multiple preparatory activities for its XVII World Water Congress planned to take place in 2020, in Daegu,

Republic of Korea. The theme of the Congress was agreed to be “Foundations for Global Water Security and Resilience: Knowledge, Technology and Policy”. It is the first time that the World Water Congress will be held in East Asia. Its main objective is to provide an ideal platform for researchers, professionals, experts, policymakers, students, and stakeholders to exchange ideas, present new knowledge and learn from each other in the field of water policy and sciences around the world. As this Congress focuses on Water Security, IWRA wanted to hear stories from different younger representatives of communities facing Water Security issues. A competition was launched to identify these individuals. This World Water Envoys program is unique, as it gives an opportunity to young people that are not necessarily from the water world to become the ambassadors of their communities, meet with international water experts, raise the profile of the

water issues their communities face, and hopefully bring some concrete solution back to where they live. The final decision was very hard, but in the end 5 candidates were selected as winners, trying to ensure a geographical balance, as well as a good variety of water security challenges.

Three new Task Forces were launched on Water Security, Climate Change, and IWRA 50th Anniversary. The Task Forces have proven to be an effective way of engaging more deeply with active members on specific topics and projects, giving them opportunities to get directly involved in projects that IWRA is partnering with other international organizations to deliver.

An important Water Security project with UNESCO’s International Centre for Water Security and Sustainable Management (i-WSSM) was launched with the assistance of a

new, associated member-led Task Force. The agreement between UNESCO i-WSSM and IWRA was finalized to produce the annual Global Water Security Issues (GWSI) Papers series to collect case studies on emerging and future global water security issues in the context of SDGs. IWRA is now managing the collection and editing the case studies being used in this publication. Given the complexity and range of the topic of water security, a sub-theme is selected for each GWSI Paper Series. In 2019, the sub-theme was: Water Reuse within a Circular Economy Context.

In 2019, eight issues of Water International were produced, including 4 special issues. Five Policy Brief documents were published in 2019, either as part of the “Blue Series” based on 4 Water International special issues or otherwise as part of the “Green Series” (Policy Brief on

Compensation for Flood Storage). In 2019, IWRA held webinars on eight different topics. These online events were based on either selected special issues of Water International, or in relation to other water related events, such as the World Water Day, etc. Overall, 825 registrants participated for free in these eight webinars.

A renewed IWRA website was launched in October, presenting a more interactive interface and a fresher look. The website is completely redesigned with new features and more user-friendly menus and sections, as well as security enhancements. Over the year, IWRA's website received over 150,000 visitors and more than 480,000 visits.

Source: IWRA Communication Division, 2019 IWRA Activity Report

7.7. OIC Water Council

The Organization of Islamic Cooperation (OIC) was established upon a decision of the first high-level Islamic Conference, which took place in Rabat, Kingdom of Morocco on 25 September 1969. In March 1970, the first ever meeting of Islamic Conference of Foreign Minister (ICFM) was held in Jeddah; it was decided to establish a permanent Secretariat in Jeddah headed by the organization's Secretary General. OIC consists of [57 members](#) and [5 observers](#).



The **Water Council of OIC** is the execution branch of the Ministers of Water Resources in OIC Member-States. The Council aims at activating cooperation among the OIC Member-States on water, in addition to following up the efforts and progress achieved in this regard. Following the results of the first meeting held in November 2017 in Turkey, the Water Council approved the Program of Actions for 2017-2023, which provides for:

- assessment of institutional and human capacity requirements in Member-States;
- collaborative activities amongst water institutes of OIC countries and arrangement of joint events;
- training workshops for government officials, civil society, private sector, academic and research institutions of the Member-States;
- promotion of network of Centers of Excellence in collaborative arrangements with the Member-States;

- improvement of water infrastructure of the Member-States.

Activities in 2019

The second meeting of the OIC Water Council was held as part of the [Cairo Water Week](#) (20-22 October). It is considered as an attempt to put countries on the right track to implement their national water strategy under the general framework of the OIC Vision. The program of the second meeting included a meeting of senior officials of the Council Member-States (21 October), which discussed capacity building, wastewater treatment, transboundary issues, and financial support, and the Ministerial Meeting of the OIC Water Council (22 October), where recommendations were adopted to motivate cooperation among the OIC Member-States.

Recommendations of the second meeting of the OIC Water Council:

- To adopt a more focused approach and develop synergies among OIC institutions'



activities, the meeting requested OIC institutions to conduct capacity-building and training workshops, in particular on the water monitoring network and early warning system; water conservation and productivity in the agricultural sector.

- To exchange information with various stakeholders and share innovative me-

thods and new mechanisms for addressing water-related issues adopted by OIC countries.

- It is recommended that the web portal on water be re-launched. The portal should focus on highlighting success stories, case studies and other information on water-related activities undertaken by member states.
- The network of centers of excellence in the Islamic world should be established to share experiences.
- The OIC Secretariat should work closely with member states and other OIC institutions to organize a meeting of the OIC water research institutions in the near future.
- To overcome the lack of technical and financial resources in many OIC Member-States for the development of water strategies, as well as for conduction of and cooperation on innovative research to achieve various mitigation measures, the OIC General Secretariat is invited to work with other regional and international stakeholders to establish institutional mechanisms to benefit from available funds and international best practices, as well as opportunities for capacity building.

Source: Information provided by the GEF Agency of IFAS

7.8. Stockholm International Water Institute and World Water Week



The Stockholm International Water Institute (SIWI) is a Swedish not-for-profit foundation, which seeks to strengthen the governance of fresh water globally, regionally, nationally, and locally. Its priority areas include cooperation over shared waters, informed international policy and improved water governance.

In 2017, the 2018-2021 Strategy was adopted, based on which SIWI intends to influence decision-makers, by combining its convening power with their

expertise in water governance, and by building dialogue, improving policies, and changing water governance practice.

World Water Week

The Stockholm World Water Week is the leading annual global event for concretely addressing the planet's water issues and related concerns of international development. World Water

Week 2019 gathered 4,000 participants from 138 countries, 47 exhibitors, 277 sessions and 578 convening organizations on the theme "Water for society – including all". The overarching conclusions can be summarized as "Inclusion is key to addressing today's challenges". During the 2019 World Water Week, SIWI hosted a special delegation from Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan in partnership with SDC. Each country delega-

tion included representatives of the relevant water ministry, ministry of foreign affairs, and institutes of strategic studies. Ensuring the participation of a Central Asian delegation at the world's leading annual water event gives a unique opportunity for experience-sharing, learning of the latest developments in the water sector around the world and provides the delegates a networking prospect for establishing new partnerships. In addition to participating in full at the World Water Week the delegation also took part in several meetings organized for the invited delegation to share views on top priorities for transboundary water cooperation; current national initiatives meant to address these priorities; gaps or hurdles remaining to take new or more substantial steps towards strengthening regional cooperation.

SIWI's Activities in Central Asia

In Central Asia, SIWI is engaged in supporting multi-track riparian dialogues surrounding transboundary water management, as well as targeted capacity building and networking opportunities to elevate regional water coope-

ration dialogue. Providing capacity building and knowledge management for young professionals is an ongoing priority for SIWI in line with SIWI's three cross cutting issues of gender equality, youth empowerment and human rights-based approaches.

SIWI's ongoing collaboration with CAREC continued in 2019. On the request and invitation of CAREC and OSCE, SIWI led a three day training session on Water Diplomacy during the Central Asian Leadership Program on Environment for Sustainable Development (CALP) in Almaty, September 2019. The overarching themes of the training sessions were the intersections between gender equality, water management and conflict prevention. The training was attended by 30 early and mid-career professionals from the environment and water fields. The main objective of the training was to strengthen young professional voices and develop the next generation of water and environment leaders, including water diplomats in Central Asia.

Source: www.siwi.org

7.9. 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”



9th WORLD WATER
FORUM | DAKAR 2021

On 4-5 February, the 9th World Water Forum partners held a meeting in Dakar to discuss various aspects of the two-year preparatory process. Patrick Lavarde and Abdoulaye Sene, Co-Chairs of the Forum International Steering Committee (ISC), will lead the preparation in conjunction with the Working Groups for each of the Forum Priorities. The meeting provided a solid basis for further cooperation on subjects such as the establishment of the 9th Forum Secretariat, the website and the communications strategy. The participants also evoked the preparation of the Forum Kick-Off meeting held in the new city of Diamniadio, Senegal on 20 and 21 June 2019. The meeting brought nearly six hundred organizations and experts from around the world who contributed in the construction of the program for the [Dakar World Water Forum](http://www.worldwaterforum.org) in March 2021. It is important to note that previous editions of the World Water Forum

included three major processes: thematic, political and regional. The 9th World Water Forum in Dakar will mark a break with the institutional organization of past Forums. It focuses on an integrated preparation based on quality exchanges, multiactors around a limited number of priorities integrating the previous tools of the processes: thematic, political, regional, citizen. The Dakar 2021 Forum will focus on four SDG-related priorities: (1) Water Security and Sanitation; (2) Cooperation; (3) Water and Rural Development; (4) Means and Tools, including Finance, Governance, Knowledge Management and Innovations, each of which will be coordinated by a Pilot Group. In December, a call for participation in Action Groups was launched to identify ways to move the water agenda forward in specific areas in an ongoing way. In this way, the Forum will be more than a series of sessions, but a commitment to getting things done together. The action groups will also draw from a broader Consultative Group, which can act as a broader community of practice encompassing a variety of stakeholders. The Consultative Groups are formed through an open call process and operate on a voluntary basis. December also saw the release of the First Announcement (a brochure).

Activities in 2019

The 1st WASAG International Forum on Water Scarcity in Agriculture was supported by WWC, FAO, IFAD, and the Governments of Italy and Switzerland (19-22 March, Praia, Cabo Verde). Discussions addressed challenges related to WASAG's six working areas: (1) Water and migration; (2) Drought preparedness; (3) Water and nutrition; (4) Financial mechanisms; (5) Sustainable agricultural water use; and (6) Saline agriculture. The exchanges gave rise to the Praia Commitment, a document that stresses the need to share learning and work together across silos to improve global food and water security.

WWC organized the High-level Strategic Workshop on Water and Climate "Raising Ambitions on the Road to COP 25" (13 June, Bonn,

Germany). The meeting met its objective of mobilizing and encouraging a range of political, governmental, institutional, technical, and scientific stakeholders, as well as NGOs and CSOs, to work together to keep water as an important element of climate discussions. The agenda of the workshop aligned with the broader goal of implementing the Paris Agreement and focused on water as a cross-cutting solution to raise climate ambitions within the UNFCCC framework. The [outcomes document](#) of the workshop "Raising Ambitions on the Road to CoP25" was published. The Council was actively involved in the UN Climate Change Conference in Madrid in December. Joining forces with key partners, the Council co-organized and supported several events, including the Water Action Event "Just Add Water: Solutions for the 2020 NDCs and beyond" co-convened under the Marrakech Partnership for Global Climate Action (MPGCA).

At Stockholm World Water Week, WWC President Loïc Fauchon opened the seminar on "[Transforming Societies to meet the SDGs: The Role of Finance](#)" co-organized by WWC, where he called for political leaders to help unlock capital for investments for ambitious water projects. "A strong signal of commitment needs to come from all levels of political governance to create the right environment that will reassure investors and attract capital" (27 August). WWC proposed ten practical responses to improve financing for water. During the World Water Week, a special members event was organized around the Council's four newly created Task Forces. This meeting allowed members to associate their efforts with the WWC's four priority areas: (1) Water Security, (2) Financing, (3) Global Changes, and (4) IWRM – Transversality (28 August). All participants were invited to share their views on activities to be led and the Task Forces they wish to engage in. Members' meetings provide unique networking opportunities with fellow Council members.

Source: www.worldwaterforum.org/en; World Water Council's activities reports No. 68-71





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 Afghanistan) in 1970. Investments to date, totaling US \$4.4 billion, include flood management, irrigation and drainage, clean water supply, sanitation, hydropower, institutional reforms, and knowledge and capacity building support. Regional technical assistance support for transboundary water resources management have been more bilaterally, such as the enhanced river basin management in the Chu-Talas (with Kazakhstan and the Kyrgyz Republic) and Pyanj river basin (for Afghanistan

and Tajikistan). Acting nationally with investments and thinking regionally with technical assistance support place ADB as a leading development partner in the region.

ADB investments in 2019 have focused on **irrigation rehabilitation and integrated water resources management**. Investment approvals in 2019 include **for Kazakhstan**, the [Irrigation Rehabilitation Project](#) which will (1) support the rehabilitation and improvement of irrigation networks serving about 171,100 ha of land in East Kazakhstan, Karaghandra, Kyzylorda, and Zhambyl provinces; (2) promote the diversification from traditional low-yielding and low-value grain crops into high-value cash crops; and (3) build the capacity of farmers and Kazvodkhoz for improved water and irrigation management. This project is ADB's first local currency lending directly to a state-owned enterprise in the irrigation sub-sector. **In Afghanistan**, the [Arghandab Integrated Water Resources Development Project](#) will improve the availability and management of water resources in the Arghandab basin in Kandahar province by (1) increasing the storage capacity of the Dahla Dam by raising its height, (2) increasing the reliability of irrigation water supplies downstream of the dam, (3) improving agriculture water productivity by providing on-farm support to farmers to improve crop production, and (4) strengthening institutions in water resource management.

Efforts continue to improve **water supply and sanitation** (WSS) infrastructure and services in Central Asia. In 2019, ADB approved a results-based lending (RBL) operation **to the Kyrgyz Republic** for the [Naryn Rural Water Supply and Sanitation Development Program](#). The program will cover 64,000 people in Naryn and will support the design, construction, and rehabilitation of WSS facilities and institutional capacity to provide sustainable and safe WSS services

across 31 villages. In addition, the program will ensure that detailed designs are completed for 12 villages and ready for implementation when additional financing becomes available. **In Uzbekistan**, the [Second Tashkent Province Water Supply Development Project](#) will support rehabilitation and expansion of a regional water supply system located in the Yangiyul and Chinaz districts of Tashkent province. The project also supports institutional reforms and capacity building for Tashkent Province Svokova, the WSS services provider.

The **Project Readiness Financing (PRF) for urban services projects in Georgia, Pakistan, and Uzbekistan** will support early preparation of engineering designs and procurement documents as part of advanced actions prior to project approval to ensure timely start up and completion of project activities

ADB has supported the [Central Asia Regional Economic \(CAREC\) Program](#). A partnership of 11 countries supported by six multilateral institutions,⁵⁵ it is working to promote development through cooperation, leading to accelerated growth and poverty reduction. In 2017, CAREC introduced agriculture and water as a key pillar under the CAREC 2030 Strategy. This now provides a conducive and trusted platform to engage in addressing water scarcity and water productivity issues as a step towards future cooperation on regional water resources management. In 2019, ADB held the first CAREC side session in Tashkent, Uzbekistan involving development partners to discuss opportunities for advancing water cooperation in the region. As a follow-up, ADB will help conduct a scoping study to outline the water pillar and its key objectives.

ADB, in partnership with ICID and Indonesian National Committee for ICID supported the

⁵⁵ Afghanistan, Azerbaijan, People's Republic of China, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan

[3rd World Irrigation Forum](#) (1-4 September 2019, Bali, Indonesia). This provided a suitable opportunity for participation by government representatives from Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan to collaborate and

share experiences on the importance of sustainable agricultural water management.

Source: Asian Development Bank

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 and have now grown to 100 approved members worldwide.



Water related activities in 2019

In October, AIIB initiated a Call for Public Consultations on its [Draft Water Sector Strategy](#). AIIB invited a diverse stakeholder group to provide their comments and suggestions on the proposed approach to the water strategy. The [Water Sector Analysis](#) provides additional information regarding how the draft strategy was developed and how the draft strategy will be implemented once approved. In December, 18 civil society organizations from 12 countries of Asia, Europe, Africa and the Americas submitted to the AIIB [initial comments](#) on the proposed draft strategy with a hope to start meaningful consultations on key environmental and social issues specific to river basin management and water infrastructure development.

AIIB has approved a US \$3.2 million loan for the [Obigarm-Nurobod Road Project](#) (October). The Obigarm-Nurobod road section of the existing M41 highway will be inundated once the Rogun HPP reservoir is filled to operating levels and will require construction of a new 76-km M41 highway alignment through mountainous terrain. Task is divided in three sections between AIIB, EBRD and ADB. AIIB will finance Section 3, which includes an approximately 800-m bridge over the Rogun HPP Reservoir, and 640 m of roadway approaches to the bridge. The objective of the Project is to maintain and improve connectivity between Dushanbe, the northeast region of Tajikistan and the Kyrgyz Republic via the M41 highway. AIIB also continued co-financing the [Nurek Hydropower Rehabilitation](#), Phase I project that was approved in 2017 (US \$60 million)

Projects in Central Asia in 2019

AIIB has approved a US \$46.7 million [loan](#) for the construction and operation of a 100-megawatt wind power plant in southern Kazakhstan which, when completed, will be the largest in Central Asia (December). The [Zhanatas wind power plant](#), supported by a Memorandum of Understanding between AIIB and the Ministry of Energy of the Republic of Kazakhstan, will, on a yearly basis, provide the country approximately 319 gigawatt hours of renewable energy and reduce carbon dioxide emissions by 260,623 tons.

In 2019, AIIB has approved co-financing of US \$82 million for the [Prosperous Villages Project](#) in Uzbekistan seeking to improve access to basic infrastructure and services by rural population in the Ferghana Valley and other lagging regions of the country. The Bank has been also considering for financing the [Bukhara Region Water Supply and Sewerage](#) in Uzbekistan, which was approved in April 2020 (a US \$ 385.1 million sovereign loan).

Source: <https://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.

In Kazakhstan, EBRD focuses on diversification, balancing the role of state and market and sustainable energy. To date, the cumulative EBRD investments in [264 projects](#) in Kazakhstan amount to €8,422 million. Current portfolio of projects is €2,732 million.

In 2019, the Kazakhstan Renewables Framework, worth US \$300 million, was expanded to US \$345 million. EBRD has allocated about US \$100 million for the construction of solar power plants in southern Kazakhstan: 100 MW plant in Zhambyl province, 10 MW plant in the Zhanakorgan District, and 50 MW plant in Challakurgan.

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 [189 projects](#) in the Kyrgyz Republic amount to €788 million. Current portfolio of projects is €199 million.

In 2019, EBRD signed an agreement on financing two more water projects in the Kyrgyz Republic. About €8.125 million, including a sovereign loan (about €4 million), an investment grant from the EBRD Shareholder Special Fund (€4 million) and from the EBRD Water Fund (€125 thousand), were provided to finance [the second stage](#) of the Rehabilitation of the Water and Sewerage System in Jalalabad Project. A loan of up to €2 million by EBRD and a grant of up to €3 million from EU will finance a number of critical [water supply system improvements in the municipalities of Jalal Abad, Myrza-Ake, Kurshab and Don Bulak](#). In May, EBRD and the Kyrgyz Republic launched a [Climate Finance Centre](#) (CFC), which will attract necessary investment for climate projects in various sectors ranging from energy and water to agriculture and health in the Kyrgyz Republic.

In Tajikistan, EBRD focuses on stabilizing and rebuilding trust in the banking sector, developing private enterprises and agribusiness, improving the availability, reliability and quality of municipal services and improving the quality of energy supply, regulation and energy efficiency. To date, the cumulative EBRD investments in 130 projects in Tajikistan amount to €699 million. Current portfolio of projects is €394 million.

In 2019, EBRD considered the allocation of €7.5 million to Tajikistan [to improve water supply and wastewater services in the city of Kulob](#)

(currently being adopted). In addition, EBRD and the Swiss State Secretariat for Economic Affairs (SECO) allocated funds for the Rehabilitation Program at the [Khujand Wastewater Treatment Plant](#) began in late 2018. The investment was supported by grants from EBRD and SECO collectively worth US \$1.4 million. In November, EBRD launched [Green Economy Financing Facility \(GEFF\) Tajikistan](#) (GEFF Tajikistan), which will offer loans for investments in high-performing technologies that improve the use of water, energy and land resources in Tajikistan. GEFF Tajikistan is supported by EU, GCF and South Korea.

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 75 projects in Turkmenistan amount to €293 million. Current portfolio of projects is €56 million. In 2019, no water projects were initiated.

In Uzbekistan, the EBRD's new Country Strategy adopted in 2018 identifies: enhancement of competitiveness by strengthening the role of the private sector's role in the economy; promotion of green energy and resource solutions across sectors; support increased regional and international cooperation and integration. To date, the cumulative EBRD investments in 78 projects in Uzbekistan amount to €1,854 million. Current portfolio of projects is €948 million.

In 2019, several water-related projects in Uzbekistan were under consideration by EBRD. Loan agreements were signed to fund the [Rehabilitation of Kashkadarya Oblast's Wastewater Infrastructure Project](#) (€53.5 million) and a [similar project in Khorezm province](#) (€80.3 million). [Namangan Regional Water and Wastewater](#) and [Rehabilitation of Water Infrastructure in Surkhandarya Province](#) projects are on hold pending the approval. Concepts were reviewed for the following projects: rehabilitation of existing HPPs on the Chirchik River at Nizhne-Bozsuy HPP Cascade ([HPP-18](#), [HPP-19](#), [HPP-22](#), and [HPP-23](#)); [Modernization of Pumping Stations Used for Irrigation Water Conveyance](#) to enhance the resilience to climate change and [Uzbekistan Climate Resilience Framework](#).

Source: <https://www.ebrd.com/>

8.4. European Union

A New Strategy on Central Asia. On 17 June 2019, the Council adopted conclusions on a [new EU Strategy on Central Asia](#), adapting the EU policy to new opportunities which have emerged in the region. The EU updated its Central Asia strategy to focus on resilience (covering areas such as human rights, border security, environment), prosperity (with a strong accent on connectivity), as well as regional cooperation. The Council reaffirms its commitment



to conclude and implement ambitious, broad-based and mutually-beneficial enhanced partnership with the interested countries of the region and emphasizes the joint interest of the EU and of Central Asian states to intensify cooperation to promote peace in Afghanistan.

EU-CA Ministerial meeting and new programs.

High-level political and security dialogues between EU and CA have been held regularly since 2013. The 15th EU-CA Ministerial meeting was held on the 7th of July in Bishkek, Kyrgyz Republic. To underpin the EU's political commitment and kick-start the implementation of the new EU Central Asia Strategy, High Representative for Foreign Affairs and Security Policy/Vice-President of the European Commission, Federica Mogherini, presented [a set of EU funded regional programs](#). Coming on top of over €1 billion of bilateral and regional assistance for the period 2014-2020, these programs, worth €72 million, will benefit all CA countries and Afghanistan on the following areas:

- *Sustainable energy:* EU will invest €20 million in a new HPP in Tajikistan, with additional support from Germany. This hydropower plant will create new opportunities for Tajikistan to meet increasing demand, and to export excess electricity to neighboring countries, including to northern Afghanistan;
- *Economic empowerment:* EU will invest €2 million in the economic empowerment of women in Afghanistan. This project will be implemented together with Kazakhstan and Uzbekistan;
- *Education:* EU also launched a new €36 million program in support of the education sector in Kyrgyzstan;
- *Inclusive sustainable growth:* EU has extended the activities of the SWITCH Asia Program, with an amount of €14 million. The programme will support sustainable consumption and production and promote inclusive sustainable growth. It aims to reduce poverty and contribute to economic prosperity in Central Asia.

In addition to those programs, **several others are in preparation:** EU's contribution in MPTFHS, upgraded phase of the Border Management in Central Asia program, and new technical assistance to support law enforcement capacities and regional cooperation in countering terrorism.

On 11 November, an agreement was signed for €5.2 million with EU to support MPHSTF (see Section "[UNDP in Uzbekistan](#)").

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 Section "[World Bank](#)"); (2) Regional coordination and support to improve the EU-CA Platform for Environment and Water Cooperation (see further).

"European Union – Central Asia Water, Environment and Climate Change Cooperation (WECOOP)"

The WECOOP project, with its third phase started in October 2019, aims to enhance environment, climate change and water policies in Central Asia through approximation to EU standards and to promote green investments in relevant sectors with the aim of contributing to measurable reductions in man-made pollution, including CO₂ emissions. Project activities among others include support to the EU-CA Platform for Environment and Water Cooperation: organization of annual meetings of the EU-CA Working Group on Environment and Climate Change (WGECC) and the 7th EU-CA High-Level Conference in 2022; support to the EU Water Initiative National Policy Dialogues meetings organized by UNECE; provision of trainings, policy advice; assistance in preparation of green investment projects.

Activities in 2019

Ministers and Heads of Delegations of the CA countries, of EU and of EU Member States responsible for the environment, climate change and water policies met on 24 and 25 January 2019 in Tashkent, Uzbekistan, for the [Sixth EU-CA High-Level Conference](#) organized under the EU-Central Asia Platform for Environment and Water Cooperation. The parties agreed that the EU-CA Platform for Environment and Water Cooperation should continue to cover the following priority areas: environmental governance, circular economy, sustainable consumption and production, climate change (adaptation and mitigation), and IWRM.

Activities in the early 2020

Over one hundred participants from Central Asian States and EU Member States attended the 9th Meeting of WGECC chaired by the Italian Ministry for the Environment, Land and Sea (12-13 February 2020). Progress and achievements in EU-CA regional cooperation and EU and CA policies in the area of environment and climate change since the 8th Meeting of WGECC and the 6th EU-CA High Level Conference on Environment and Water Cooperation were discussed taking into account the new EU Strategy on Central Asia. Moreover, the concept of the new European Green Deal was presented.

Source: <https://ec.europa.eu>, <http://wecoop.eu/>, WECOOP Project

8.5. German Society for International Cooperation



The German Society for International Cooperation or Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) implements the Transboundary Water Management in Central Asia Program (2009-2020) as part of the Berlin Process.

The Berlin Process is an offer of the German Federal Foreign Office to the countries of Central Asia to support them in water management and to make water a subject of intensified transboundary cooperation. It supplements the EU Strategy for a New Partnership with Central Asia which was adopted during the German EU Presidency in June 2007⁵⁶.

The GIZ Program is coordinating with all donor organizations active in the water sector in Central Asia. The Program is currently in its last phase which will end on 31 March 2020. It mainly is focusing on fostering regional institutional cooperation, strengthening transboundary river basin management and implementing national pilot projects. In 2019, support was given to the development of ASBP-4, as well as to the regional working group on institutional strengthening of IFAS. In December, ASBP-4 was approved by the regional working group.

GIZ works with BWOs Amu Darya and Syr Darya to strengthen capacities and rendered also technical support. In 2019, the Program, together with the Kazakh Executive Board of IFAS installed fish saving technology at the Kok-Aral Dam at the Northern Aral Sea to prevent little fish from slipping over the dam and dying there.

Technical assistance in the form of water measuring devices, vehicles and IT equipment was rendered to the partner organizations in Turkmenistan. The Program also supported the experience exchange of Central Asian water specialists and decision makers at international events and within Central Asia. The Program actively supported the coordination of water management between Uzbekistan, Tajikistan and the Kyrgyz Republic in the Fergana Valley. In Uzbekistan, GIZ entered 2016 into a delegation agreement with EU to implement component 1 on water governance within the frame of the EU Program "Sustainable management of water resources in rural areas in Uzbekistan" (2016-2020).

Working on three levels – national, basin and local level – the first digital data management system (water and water infrastructure cadastres) were created, 60 ha of pilot sites planted with over 70.000 different fruit trees and equipped with water saving irrigation technology to showcase best practice to local water management specialists and farmers. Two river basin management plans for Aksu and Shakhrihansay Rivers were developed.

⁵⁶ A new European Union Strategy for CA was adopted in June 2019 (see above)

The Program developed an IWRM curriculum for Master studies at the Academy of Public Administration under the President of Uzbekistan and a new basin planning curriculum for the TIAME Master studies. Study tours to European countries helped to exchange information and best

practices on IWRM, water governance and legislation drafting as well as dam safety issues.

Source: GIZ Transboundary Water Management in Central Asia Program

8.6. Organization for Economic Cooperation and Development

The Organization for Economic Cooperation and Development (OECD) is a multidisciplinary inter-governmental organization comprising 36 member countries that 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 countries meet the water challenge, with focus on economic and financial dimensions of water management and improving governance and reform of water policies. 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](#), [Water Governance Initiative](#), and the [Network of Economic Regulators](#). Particularly, the following events were held in 2019:

- 2 Roundtables on Financing Water: focused on the Americas (26-27 June, Washington); focused on Asia (26-27 November, Manila). [Making Blended Finance Work for Water and Sanitation](#) was published;
- [12th Meeting](#) of the OECD Water Governance Initiative, where [Applying the OECD Principles on Water Governance to Floods](#) was presented (20-21 June, Berlin). It peer-reviewed National Water Policy Dialogues (NWPDs) with Argentina, Peru, and Brazil, learned from Germany's water governance, as well as discussed the role of women in water governance;
- 2 webinars of the Working Group on Indicators ([20 May, 4 November](#)) and of the Working Group on Capacity Development ([20 May, 4 November](#)).

[The OECD Council Recommendation on Water](#) captures policy guidance that 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.

OECD work in Eastern Europe, the Caucasus and Central Asia

In the region, OECD works with partner countries through its [GREEN Action Task Force](#), which provides a unique forum for a mutual exchange of best practices and challenges between the Eurasian region and OECD countries, building on the OECD and its partners' work on environment. The Task Force Annual Meetings have been held to trace its Programme of Work since the previous meeting. The [2019 Meeting](#) focused on the topics of sustainable infrastructure development, cooperation with development finance institutions to promote green investment, strategic planning for water management, and the role of national environmental funds. Several discussion papers and support material were prepared by the OECD to facilitate discussion at the meeting. Good progress has been achieved in the implementation of all areas of work, some of them bringing very concrete results on the ground, as for example: completion of the revisions of the Environmental Code in Kazakhstan, support to improving long-term water security in Belarus, or revising mid-term action plan for water supply and sanitation strategy implementation in Moldova.

The OECD assists 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 program 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. The water-related cooperation has focused on multi-stakeholder National Policy Dialogues in both EaP and Central Asia countries and has assisted, amongst other things, in development of national long-term water strategies and water policy outlooks. In 2019, meetings of the Steering Committee of the National Policy Dialogue on IWRM were held in a number of countries: 15th meeting in Tajikistan (28 June), 8th meeting in Azerbaijan (12 July), 18th meeting in Armenia (15 October), 5th meeting in Moldova (25 October), 3rd meeting in Ukraine (5 November), and 2nd meeting in Belarus (5 December).

Within the framework of the Agreement between the Government of the Republic of Kazakhstan and OECD approved in 2018, the project “Introduction of Green Growth Indicators and Preparation of the Report on Green Growth in Kazakhstan” was implemented. The main goal of the project is to assist Kazakhstan in integrating the measurement of green growth into the regular reporting and planning system, in imple-

menting the Concept for the transition to a green economy, in assessing progress and achieving green growth. The results and conclusions of the project were presented in the first National Report based on the OECD Green Growth Indicators in Kazakhstan (November). Water indicators, such as water productivity, freshwater availability and access to drinking water, were also considered among the 44 identified indicators. It is important that the project assessed qualitative indicators, for example, water use efficiency rather than simply consumption of water resources, access to clean water instead of general access to water and so on.

Recent publications from the regional program include “[Enhancing the Economic Regulatory System for Moldova’s Water Supply and Sanitation](#)” which aims at supporting the development of a sound economic regulatory system for the water supply and sanitation sector in the Republic of Moldova.

Source: <http://www.oecd.org/>

8.7. Organization for Security and Co-operation in Europe



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. Following are some highlights of the OSCE's work in these areas during 2019.

The OSCE Program Office in Bishkek (POiB) with assistance of the Office of the Co-ordinator of OSCE Economic and Environmental Activities (OCEEA) organized water quality assessments in the territory of the Chu and Talas rivers and their tributary basins. The assessments were conducted by the members of the Working Group on environmental protection under the Secretariat of the Chu-Talas Water Commission between Kazakhstan and Kyrgyzstan. During the meeting of the Working Group held in Bishkek, the laboratory results on the state of water quality of the rivers were presented. They will be used for long-term planning of environmental protection activities in the basin.

The OSCE Program Office in Dushanbe (POiD) contributed to the sharing of international and

national best practice at two national conferences and two water related national platforms. POiD, together with the Ministry of Energy and Water Resources (MEWR) and the International Institute for Cultural Diplomacy (IICD) organized the International Conference “Water without Borders” in Dushanbe. The event was conducted in the framework of the World Water Day with the aim of increasing the visibility of water resources issues in general and Tajikistan’s Water Sector Reform Program 2016-2025 in particular. POiD supported the Agency of Land Reclamation and Irrigation (ALRI) by facilitating one annual membership meeting of the National Commission on Irrigation and Drainage (TajNCID) and conducting a scientific and practical conference on “Development of the Land Reclamation and Irrigation Industry”. POiD jointly with GIZ and ALRI organized a study tour for five representatives of TajNCID to learn from advanced irrigation practices within Uzbekistan. The agenda of the trip focused particularly on experiences in drip irrigation technologies applied to orchards and cotton, as well as advanced (digital) water flow meters (Smart Sticks). Finally, POiD organized its 3rd capacity building workshop for young researchers from Central Asia and Afghanistan in water policy studies. Participants enhanced their theoretical and practical knowledge to produce high quality research papers.

The OSCE Program Office in Nur-Sultan (POiN) worked together with OSCE POiB and OCEEA to facilitate the activities of the transboundary basin council for the Chu-Talas Water Commission with an ultimate goal to strengthen cooperation between the two countries. The Office supported cooperation between Kazakhstan and Kyrgyzstan on carrying out surface water sampling and analysis of water quality. Collaboration with the Russian Federation was further enhanced by supporting joint activities on sustainable water management of the transboundary Zhaiyk (Ural) River and the organization of a [technical meeting on the rational use of water resources of the Zhaiyk River](#), including an assessment of the impacts of climate change on water resources. In collaboration with UNECE and the Slovak Government, POiN supported a study tour for six government and private sector officials on legislative aspects of hydropower plants management, technical and safety supervision and practical examples of transboundary water management in Slovakia.

The OSCE Centre in Ashgabat (CiA) supported the organization of two regional events with the aim to promote regional dialogue and cooperation among the countries of the Aral Sea basin, using the platform of IFAS. The first event was the 2nd meeting of the Regional Working Groups on development of ASBP-4, which discussed the organizational structure of IFAS and the continuation of the implementation of its regional initiatives. The second event was a regional seminar focused on innovative solutions and advanced technologies for sustainable water management and aimed to showcase the advanced regional experience in water management and strengthen regional and interagency dialogue and cooperation for sustainable development of the water sector. In addition, CiA provided assistance in the publication of the Outcome Report on Turkmenistan's Chairmanship in IFAS, which is a key reference document to provide management succession and policy continuity within this regional organization.

The OSCE Project Co-ordinator in Uzbekistan (PCUz) continued its collaboration with the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection in monitoring of pollution in the Syr Darya River Basin and in the assessment of the transboundary impact of toxic wastes. The three critical areas (settlements of Vuadil, Madaniyat and Baymak along the Shakhimardan, Mayluu-Suu and Sumsar Rivers) were identified during previous phases of this project which aimed at monitoring the composition of various pollutants in the water resources as well as supporting the government of Uzbekistan in the implementation of efficient Disaster Risk Reduction mechanisms in these areas. Furthermore, PCUz continued its support to the GEF Agency of IFAS for regular monitoring of the development of biodiversity on wetlands that have formed on the former grounds of the Aral Sea. As part of its support to ICWC, PCUz published 48 copies of the 2018 Water Yearbook "Central Asia and Around the Globe", drafted and compiled by SIC ICWC.

Capacity building

OCEEA:

- organized a regional training course on water diplomacy with a special focus on gender-sensitive negotiation and mediation skills in partnership with CAREC and SIWI in Almaty.
- conducted a Training-of-Trainers on "How to Mainstream Gender in Water Governance" in partnership with the OSCE Secretariat Gender Section and PCUz.
- supported the participation of 5 participants from Central Asia at the workshop on Water Diplomacy: Best Practices in Transboundary Water Cooperation organized in collaboration with the Central Commission for Navigation on the Rhine in Strasbourg.

Source: Office of the Co-ordinator of OSCE Economic and Environmental Activities

8.8. Swiss Confederation (SDC and SECO)

The [Swiss Cooperation Strategy for Central Asia \(2017-2021\)](#) features a special focus on water, infrastructure and climate change, aiming at (1) Supporting Central Asian States in their efforts to provide the necessary framework that allow a joint and equitable management of regional shared waters and (2) Enhancing equitable access to and use of well-managed water resources for households, agriculture and other economic sectors in a changing climate.



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

State Secretariat for Economic Affairs SECO

The Strategy 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 National Water Resources Management, Water Supply and Sanitation and Disaster Risk Reduction/Climate Change Adaptation. Additionally, 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. Through the BPCA Dialogue platform set up under this initiative, multiple exchanges between delegations of Central Asian countries have been organized and facilitated, in cooperation with CAREC:

- Together with other like-minded development partners and the countries of Central Asia, a series of dialogues on "water as a key factor for sustainable development in Central Asia" was initiated, including a [session at the Astana Economic Forum](#) (May 2019) and follow-ups during the Stockholm World Water Week (August 2019).
- Various other exchanges between country representatives were organized, including

meetings of the Regional Working Group on Water Quality, as well as a bilateral exchange between Uzbekistan and Kyrgyzstan representatives on water balancing on the Chu-Talas Rivers.

Finally, the Blue Peace Central Asia has been supporting the relaunch of 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. The network benefits from the support of GKU and the International Secretariat for Water.

Switzerland further contributes to the Central Asia Water Energy Development Program (CAWEP), a multi-donor trust fund managed by the World Bank. It aims at strengthening the enabling environment to promote energy and water security at regional level and in the beneficiary countries. The Program supports national as well as cross-border activities. National activities, such as institutional strengthening and efficiency improvements, contribute to and present fundamental building blocks to strengthen national capacity to achieve energy and water security, sustainable development and climate resilience at the regional level. Furthermore and as regards regional or cross-border operational activities, in 2019, Switzerland continued its support to the Chu-Talas river basins on the automation of water accounting as well as on improving glacier monitoring in Central Asia.

Source: Regional Water Advisor for Central Asia, Embassy of Switzerland in Kazakhstan

8.9. United States Agency for International Development



The United States Agency for International Development (USAID) works across the whole Central Asian region to transform water sharing problems into cooperation that would lead to better and equitable water management.

Tajikistan

The US Embassy, together with the Ministry of Agriculture of Tajikistan, government representatives of Khatlon Province hosted an [event to celebrate the accomplishments](#) of the USAID Feed the Future Tajikistan Agriculture and Water Activity over the last four years (24 October, Khatlon pro-

vince). The event highlighted U.S. government contributions to increase, diversify, and add value to the production, post-harvest handling, and processing of agricultural products in an effort to address malnutrition and market surplus production in southwestern Tajikistan.

Turkmenistan

The USAID's Smart Waters program [handed over a US \\$170 thousand dredger](#) to the State Committee for Water Resources of Turkmenistan to clean up the Murghab River (10 December, Tashkopi, Mary province). It will help prevent flooding in the densely populated Mary province, as well as prevent mud deposits in the Mary province's water reservoir.

USAID and the Union of Industrialists and Entrepreneurs of Turkmenistan (UoIE) [conducted a](#)

[fruit tree production workshop](#) for orchard owners and agronomists (24 July, Ashgabat). USAID's horticulture advisor shared key techniques and technologies to sustainably maximize production of high-value fruits with high export potential such as cherries, apples, and grapes. By equipping orchard owners with horticultural best practices and supporting export promotion, USAID and the UoIE aim to build sustainable links between Turkmen producers and new target markets.

Uzbekistan

At a workshop conducted within the "Provision of Science Based Evidence on Climate Induced Water Quality Challenges in Amu Darya Basin" project, [scientists presented findings](#) demonstrating the negative impacts of climate change on water quality in the Amu Darya River basin (11 April, Tashkent). Results from the research will help authorities make better-informed decisions on water use and management.

With assistance from the USAID Smart Waters project: (1) a [second joint meeting](#) of the Uzbek and Kyrgyz Padshaota River Small Basin Councils was held to help boost local governance, ownership, and cooperation over shared water resources between upstream and downstream countries in Central Asia (22 April, Namangan); (2) the annual [two weeks Summer School Education Program](#) was launched with TIAME. The participants learned about water infrastructure, sa-

fety, basin management, irrigation and drainage systems, and environmental aspects of water resources management.

The U.S. government-funded C5+1: Adaptation Planning project held a [two-day training workshop](#), where the participants learned climate change adaptation planning concepts and principles in the areas of agriculture and disaster risk management to prepare the country for long-term climate change (13-14 June, Tashkent). The participants were encouraged to develop a timeline and to identify concrete next steps for carrying out adaptation planning in priority sectors in Uzbekistan to reach the country's long term goals and objectives.

Regional activity

USAID supported a [two-day region-wide workshop](#) on the Concept and Prospects for a Central Asia Regional Electricity Market (CAREM). The meeting was aimed at providing support to Central Asian countries to increase regional electricity trading. Power sector representatives from all five Central Asian countries attended the workshop and shared their nation's experiences on recent developments and current priorities in their respective power sectors. International experts presented best practices of electricity markets successfully implemented in other regions.

Source: www.usaid.gov

8.10. World Bank

Central Asian Water and Energy Program (CAWEP)

In 2019, the [Central Asia Water and Energy Program \(CAWEP\)](#) continued implementation of its phase III. CAWEP is a multi-donor trust fund with a total budget of US \$12.4 million financed by EU, Switzerland and UK. 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.



Ongoing water activities focus on the following key issues: (1) Improving management of sub-basins that have transboundary significance by supporting an investment needs assessment; (2) Modernizing irrigated agriculture to bring water in the region to its most productive use or more productive uses with a focus on increased awareness and development of irrigation modernization vision and strategies in Central Asian countries; (3) National water management by focusing on policy, advisory and technical support to benefit regional water security; and (4) Regional water management to strengthen the capacity of national hydrometeorological services to better deliver useful and demand-driven information services to key sectors including water, energy, disaster risk management, and agriculture.

As a part of the CAWEP effort to promote national and regional water security across Central Asia, two technical workshops were organized. One focused on [irrigation modernization](#) and the other on [water supply and sanitation](#) (November). Both considered the shared challenges of sustainability and climate resilience, and both shared information and experiences among sector professionals. The workshops helped promote regional cooperation at technical level and identify and prioritize follow-up activities at national levels.

A brochure [Towards Water Secure Sustainable Economies](#) (2019) was prepared to stimulate policy dialogue across Central Asia countries on the risks of continuing “business as usual” and the opportunities from pursuing alternative water development pathways. Three action areas are highlighted: (1) Invest in water supply and sanitation for social stability and human capital development; (2) Overhaul water resources and irrigation management for increased productivity; and (3) Invest in adaptation measures to build economic and social resilience to climate change.

The focus of energy activities is to contribute to national and regional building blocks for energy production and trade. Ongoing analytical work explores new electricity production opportunities in the Kyrgyz Republic, Tajikistan and Uzbekistan and regional energy connectivity and market development potential. Capacity building activities aim at improving sustainability of the organizational capacity of CDC “Energy” as the regional power system operator and strengthening national institutions, so they can deliver electricity services both to national customers as well as to regional systems. CAWEP helped design important policy, regulatory, and financial reform measures for the power sector that informed the Program of Financial Recovery of Barqi Tojik for 2019-2025, approved by the Government of Tajikistan in April 2019, and supported preparation of an innovative and transformational program for results in Tajikistan – Power Utility Financial Recovery Project (US \$134 million IDA grant⁵⁷).

The Central Asia Knowledge Network (CAKN) continues to connect people to enhance regional knowledge and professional capacity in the areas of water resource management, energy and climate change in the Central Asia region. CAKN supported several initiatives aimed at

assessment of the existing capacity in the region and improvement of the academic and research potential. They included: a [stocktaking review and mapping](#) of water-related knowledge and capacity building initiatives by international partners in Central Asian countries; a [review of water-related academic and research capacity](#) in Central Asian countries; and trainings for researchers to improve their technical writing skills for peer-reviewed journals on water and energy-related issues in Central Asia. CAKN supported the [First Aral Sea Summer School](#) (10-18 August, Aralsk, Kazakhstan), organized by the Central Asia Youth for Water Network in cooperation with the Kazakh-German University. The Summer School helped future water leaders better understand the situation in the Aral Sea Basin and learn more about nature-based solutions, ecosystem-based disaster risk management, climate change adaptation, monitoring and assessment of water use efficiency, and data tools for research and monitoring such as the [Central Asia Water and Energy Data Platform](#). The Data Platform, available in both English and Russian, provides access to data by collecting in one location much of the existing publicly available spatial data and energy and water studies (and data behind them). [E-learning video modules](#) were successfully integrated into the curriculum of the master’s program “Integrated Water Resource Management” and the master course “Land and Water Interaction” at Kazakh-German University in Almaty, Kazakhstan.

Afghanistan was included as a beneficiary country for the third phase of CAWEP. Afghanistan’s strong interest to connect more closely with its Central Asian neighbors is supported through two CAWEP-financed activities. The first activity, under the Water-Energy Linkages Pillar, focuses on strengthening collaboration between Afghanistan and Tajikistan on hydromet and flood risk management. As a result of two meetings, Afghanistan and Tajikistan agreed on a roadmap for further cooperation on early warning system in the Pyanj River, joint assessments, climate change modeling, studies on glaciers, use of data from satellites and mountain radar stations, and technical capacity development (June and November). The second activity, under Energy Security Pillar, explores technical, operational, and legal requirements for Afghanistan’s integration in the Central Asian power system and will facilitate a synchronization dialogue between Afghanistan and Central Asian countries.

Source: World Bank, “CAWEP”

⁵⁷ Approved on 25 February 2020





Section 9

Water Education

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

9.1.1. Kazakhstan

Al-Farabi Kazakh National University

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

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

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

Major Events and Activities in 2019

Al-Farabi KazNU organized:

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

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

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

Source: www.kaznu.kz/en

Kazakh National Agrarian University

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

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

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

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

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

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

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

Major Events and Activities in 2019

KazNAU hosted:

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

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

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

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

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

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

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

Taraz State University named after M.Kh. Dulati

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

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

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

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

Major Events and Activities in 2019

TarSU held:

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

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

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

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

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

South Kazakhstan State University named after M. Auezov

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

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

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

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

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

German-Kazakh University

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

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

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

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

GKU offers:

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

Major Events and Activities in 2019

GKU hosted:

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

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

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

GKU’s Natural Resources Institute hosted:

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

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

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

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

CAY4W:

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

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

Nazarbayev University

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

Major Events and Activities in 2019

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

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

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

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

GSPP organized and held:

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

9.1.2. Kyrgyz Republic

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

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

Major Events and Activities in 2019

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

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

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

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

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

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

KRSU teachers and students participated in various events:

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

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

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

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

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

Kyrgyz National Agrarian University named after K. I. Skryabin

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

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

Major Events and Activities in 2019

KNAU hosted:

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

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

KNAU teachers and students participated in various events:

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

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

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

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

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

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

Major Events and Activities in the academic year 2018-2019

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

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



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



In-stream and off-stream Ala-Archa reservoir

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

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

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

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

American University of Central Asia

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

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

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

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

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

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

Major Events and Activities in 2019

AUCA hosted:

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

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

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

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

Source: www.auca.kg/

9.1.3. Tajikistan

Tajik Agrarian University named after Shirinsho Shotemur

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

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

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

Major Events and Activities in 2019

TAU hosted:

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

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

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

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

9.1.4. Turkmenistan

Turkmen Agricultural University named after S.A.Niyazov

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

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

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

Major Events and Activities in 2019

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

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

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

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

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

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

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

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

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

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

Turkmen Agricultural Institute

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

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

Major Events and Activities in 2019

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

9.1.5. Uzbekistan

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

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

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

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

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

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

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

Major Events and Activities in 2019

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

TIAME organized and held:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

National University of Uzbekistan named after Mirzo Ulugbek

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

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

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

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

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

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

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

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

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

Major Events and Activities in 2019

NUUz organized:

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

Participation in Events

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

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

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

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

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

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

Samarkand State University

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

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

Major Events and Activities in 2019

SamsU hosted:

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

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

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

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

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

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

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

Karakalpak State University named after Berdakh

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

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

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

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

Major Events and Activities in 2019

Berdakh KSU hosted:

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

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

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

⁷² Center for International Cooperation in Agronomy and Warm Climate Research

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

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

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

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

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

9.2. Regional HEIs and Professional Development Centers

9.2.1. Regional Training Center at SIC ICWC

Water sector professional development courses in Central Asia were established at SIC by the ICWC decision (ICWC Protocol No. 24 of 23.10.1999). The courses were founded by the ministries of agriculture and water resources of five CA states, SIC ICWC, BWO Amu Darya, and BWO Syr Darya. Later, these vocational training courses were transformed into the Regional Training Center (RTC) at SIC ICWC. RTC branches were also established in Almaty (Kazakhstan), Bishkek and Osh (Kyrgyzstan), Dushanbe and Khujand (Tajikistan), and Urgench (Uzbekistan).

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

Major Events in 2019

RTC provided:

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

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

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

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

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

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

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

Major Events in 2019

UCA's MSRI held:

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

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

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

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

⁷⁴ As part of the PALESCA project

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

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

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

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

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

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

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

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

Source:

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

9.3. Professional Development Courses and Trainings

9.3.1. Professional Development Courses and Trainings in 2019

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

9.3.2. Professional Development Courses and Trainings in 2020

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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





Section 10

Science
and Innovations

10.1. Innovations in 2019

Innovations in Agriculture

Agricultural Mechanization and Robotics

According to a new report from [Tractica](#), global shipments of agricultural robots will increase at a fast pace over the next several years, rising from approximately 60,000 units annually in 2018 to more than 727,000 by 2025. The market intelligence firm anticipates that UAVs will top the list among agricultural robot categories, followed by driverless tractors, material management robots, soil management robots, and dairy management robots. Tractica forecasts that such shipments will drive a total annual market value of \$87.9 billion worldwide by 2025.

Precision Hawk is a major supplier of [drones for crop health monitoring](#), with a portfolio of models from DJI, BirdsEyeView, and BFD. Sensors from MicaSense and others include lidar (with point clouds up to 500 points per square meter), thermal (which collects radiometric data), hyperspectral (which captures minerals and vegetation information), multispectral (which can see both visible and invisible light radiation), methane detection lasers, optical gas indicators, and RGB cameras. Furthermore, they automatically spot areas of concern such as cracked insulators, damaged cross arms, corrosion, leaning poles, pests, drought, and weeds, and they power services like plant counting, livestock health monitoring (from elevated body temperature), grove maturity estimation, volume measurements, and estimating plant vigor, leaf area, canopy cover, tree crown sizing, water quality, and more.

A Syracuse, NY-based **startup called Dropcopter** has been using drones to disperse collected pollen ([hexacopters](#)) successfully in a handful of crops, including almond, apple, cherry, and pear. In three years of trials, using drone-augmented pollination increased yields by 25% to 50%.

John Deere has [launched its next generation](#) of self-propelled sprayers. With the new R4140i 4000 L capacity and R4150i 5000 L capacity machines, engineers have further increased performance, precision, safety and operator comfort.

Engineers from Bosch have created a [robot](#) that can self-navigate and automatically prune roses and trim bushes. Trimbot, as this little fella is called, is designed to navigate itself in a garden and trim various plants. Trimbot has five pairs of cameras, which allow this robot to see the world

as we do – in 3D. Trimbot is pre-programmed with a rough outline of a garden to aid navigation. It does its job with a flexible robotic arm and an automated lawnmower, both designed by Bosch. Trimbot scans the bush with all of its eyes and compares its silhouette with the ideal shape for that particular bush. This helps the Trimbot to determine which branches are in need of cutting.

Robot farming startup Iron Ox announced that it's selling [robot-reared leafy greens](#) in a single location in California. It uses a combination of robotic picking arms, hydroponic vats, and self-driving porters to grow vegetables. In the future, it should help reduce the area through intensive development patterns and increase yields by 30%. But despite its repeated claims that its farming is "autonomous," humans are still needed for a lot of the work. Laborers plant seedlings and package plants when they're ready to eat: robots just tend them while they're growing.

Monitoring of Agricultural Processes

John Deere has developed the [HarvestLab 3000](#) using sensor's near-infrared (NIR) system to evaluate nutrient characteristics of forage crops and feed can now be used to provide accurate values for major constituents found in liquid manure used for fertilizer. HarvestLab 3000 measures nitrogen, phosphorus and potassium values and more for liquid manure applied as fertilizer. The system provides accurate, real-time values for total nitrogen, ammonia nitrogen, potassium, phosphorous and dry matter content of the manure as it's applied to the field. HarvestLab analyzes the entire load in real time, so applicators know exactly how much material is applied per acre and what the nutrient values are.

The team of researchers from the University of Lincoln, UK, is designing and building the [specialist app](#) to help farmers in hot climates identify and record the spread of locusts on their land, reduce pesticide residue levels, and protect environment. By recognizing locusts through the smartphone's camera, the app will be able to identify the stage of the insect's growth and record its location through the phone's IP address. This information can then be accessed by the farmer so that they can use pesticides more accurately and to target the insects in the early stages of their lifespan, significantly reducing the amount of crop damage.

News in Growing Technology

Potato Technology Centre (PTC) at Shamgarh in Karnal with the help of Central Potato Research Institute (CPRI), Shimla, is going to start work on a research project for producing potato in air by the [aeroponics technique](#). Aeroponics is a process of growing potato in air or mist environment without soil and other growing media. Microplants would be planted in the aeroponics unit and roots would be suspended in the air in the dark chamber of a high-tech greenhouse. The nutrient supply to roots would be made through nozzles under pressure. With no exposure to soil, there is no threat of soil-borne diseases. This technique will also contribute to saving around 30-40% of nutrients and fertilizers in comparison to the conventional method. The seed to be produced through aeroponics would have high production as it would give 30-50 mini-tubers (potato) from one plant in comparison to eight mini-tubers when grown in soil.

CAN-Agri (RSA) developed a [vertical crop production system](#) that requires hardly any artificial light. It comprises rows of vertical 'plant walls' that are strategically placed in the greenhouse with ample space in between them so that the whole of each wall receives plenty of sunlight. CAN-Agri has also developed a concept for the safe reuse of all the irrigation water and the high-value fertilizers it contains. The concept is based on an irrigation system that pre-treats the water, doses the fertilizers and then disinfects the irrigation water afterwards. The greenhouse technology includes an integrated Priva Connext process computer to keep the closed-loop water system and all the other processes running automatically, reliably and on schedule.

The Brigham Young University, USA scientists discover [way to make crops grow in salt-damaged soil](#). The scientists have used bacteria found in the roots of salt-tolerant plants to successfully inoculate alfalfa plants against overly salty soil. They took the roots of these salt-tolerant plants (called halophytes), grinded them up and grew the bacteria in a petri dish in the lab. Doing this, they isolated over 40 different bacteria isolates, some of which can tolerate ocean-level salt content. The team then applied the bacteria isolates to alfalfa seeds through a solution and tested the alfalfa's ability to grow in high-saline conditions. They saw significant growth of the alfalfa. The study identified two specific bacteria isolates – Halomonas and Bacillus – that worked to stimulate plant growth in the presence of 1 percent sodium chloride (salt), a level that significantly inhibits growth of uninoculated plants.

An international company with headquarters in the Netherlands may have come up with a solution in the form of the [Cocoon](#), a biodegradable vessel made from paper pulp and crop byproducts. The addition of mycorrhizal fungi, which is present in 90 percent of the world's forests, supports the root systems' ability to absorb moisture and also enhance the surrounding substrate by releasing enzymes that contribute vital nutrients. The Cocoon has two primary benefits to the seedlings it houses: a safe shelter from the harsh surrounding environment and an adequate water supply to develop healthy roots during its first year. The cylindrical shelter also protects seedlings from becoming lunch for small animals, as its high walls surround the tiny plant. The process results in strong adolescent trees that do not require external irrigation, and the Cocoon disintegrates into the surrounding soil as the tree's root structure expands. Perhaps the best part about the Cocoon is its success rate: trees planted with the biodegradable wrapping in more than 25 countries have a survival rate up to 95%.

Increased Yields, Reduced Pesticides and Pest Control

With the participation of **scientists from the Institute of Microbiology of the Academy of Sciences of the Republic of Uzbekistan**, [new types of biological fertilizers for agriculture "Fosstim" and "Rizokom"](#) have been created. This is the result of the initial activities of the US-Uzbekistan joint venture Green Biotech. In 2019, these biofertilizers were tested and had more positive results than expected: the consumption of chemical and mineral fertilizers decreased the level of soil and plant pollution by phosphorization, salinity, metatoxin decreased, the fertility of saline lands increased, and the ecological situation improved; irrigation water consumption decreased by 30 percent, and crop yields increased.

MIT researchers [have developed a new genetic tool](#) that could make it easier to engineer plants that can survive drought or resist fungal infections. Their technique uses nanoparticles to deliver genes into the chloroplasts of plant cells. Chloroplast contains about 80 genes that code for proteins that are needed for photosynthesis. The researchers developed nanoparticles that consist of carbon nanotubes wrapped in a naturally occurring sugar called chitosan. The nanoparticles pass through the plant cell wall, cell membranes and eventually the double membranes of the chloroplast. Once inside the chloroplast, the DNA is released from the nanoparticles and translated into proteins in the less aci-

dic environment. For the study, the researchers delivered a gene for yellow fluorescent protein that enables them to visualize which plant cells are expressed and found that approximately 47% of the plant cells produced the protein. The researchers tested it in spinach and other vegetables. Eventually, the team hopes to engineer a variety of desirable traits into vegetables and other crops.

Breeders' Success

Scientists in Minnesota and Kansas have been developing a grain called Kernza for over 30 years. In the near future, Kernza should replace wheat. The roots of wheat go into the ground to a depth of about 1 m, and the roots of Kernza – 5 m, which allows the plant to take much more nutrients and to be more resistant to drought. One sowing is enough to harvest several years in a row. This will reduce financial costs, human resources and, of course, will have a beneficial impact on ecosystem development as a whole.

Dr. Keerti Rathore, a Texas A&M AgriLife Research plant biotechnologist in the Texas A&M Institute for Plant Genomics and Biotechnology and Department of Soil and Crop Sciences, College Station, and **his team have developed**, tested and obtained **deregulation for the transgenic cotton plant – TAM66274**. TAM66274 is a unique cotton plant with ultra-low gossypol levels in the seed, which makes the protein from the seeds safe to consume. It maintains normal plant-protecting gossypol levels in the rest of the plant, making it ideal for the traditional cotton farmer. The scientists say this is research with a direct, positive impact on the world's food supply. The amount of protein locked up in the annual output of cottonseed worldwide is about 10.8 trillion grams. That is enough to meet the basic protein requirements of over 500 million people.

Water Conservation

The Dutch eggplant grower Greenbrothers released [underground water storage](#). The source is filled with rain that falls on the greenhouses to use for irrigation water for the plants at a later time. You can keep on filling and using it. The good thing about an ASR (aquifer storage and recovery) is that you can collect the rain during the entire year, compared to a basin, which when is full overflows to the adjacent ditch. Good quality water is lost with this, which has to

be filled with less suitable mains water or even ditch water during times of extended drought. In fact, one will collect more clean water than required for irrigation, and so one is storing good quality water in the ground, which is good for the groundwater level.

A UC Riverside-led team has created a chemical Opabactin⁷⁹ to help plants hold onto water. It mimics abscisic acid or ABA⁸⁰. However, it is 10-times stronger than ABA, works fast, stable, and cost effective. It can also be successfully applied to agricultural crops, including grains and oilseeds.

Harvesting Water from the Air

Scientists from the Southern Federal University (Rostov-on-Don) created a generator that **harvests water even from dry air**. The device operates in an autonomous mode, producing water under the effect of sunlight, without energy costs.

American scientists have developed an inexpensive and functional device for collecting drinking water from the air. The device, being a porous carcass of metal and organic, operates on solar energy. The device sucks water vapor from the air, even in the driest environments such as the desert, and then releases it as liquid.

Limerick-based scientists have succeeded in [developing a "nanomaterial", ROS-037](#), which can produce water from air even in the driest environments such as deserts. They discovered a material with favorable properties for absorbing and releasing water from the atmosphere that could revolutionize dehumidification systems in buildings and the availability of water in regions of drought. In practice, the low energy desiccant – essentially a water capture material – could replace the silica traditionally used in dehumidification systems in buildings. If silica will be replaced with this crystalline material, it would require substantially less energy to maintain air quality in buildings around the world.

An Israel-based global company Watergen Ltd has developed an innovative [atmospheric water generator](#). GEN-350 medium scale units can produce up to 900 liters of water per day and are ideal for schools, hospitals, and other entities. Large-scale units with the capacity of up to 5,000 liters (per day) are perfect for cities, villages, and large multi-purpose facilities.

⁷⁹ Overpowered and bacteria

⁸⁰ The natural hormone produced by plants in response to drought stress

Saltwater Treatment and Desalination

Irish teenager Fionn Ferreira developed a [technique to remove microplastics](#) from water using ferrofluids to capture microplastics. Before embarking on his experiment, Ferreira wagered that his magnetic liquid could remove at least 85% of microplastics from his water samples. He wound up removing around 88%.

Scientists at Princeton University in New Jersey developed a new kind of [membrane made of natural wood instead of plastic to turn saltwater drinkable](#). It undergoes a chemical treatment to strip away extra fibers in the wood and to make its surface slippery to water molecules. One side of the membrane is heated so that when water flows over that side it is vaporized. The water vapor then travels through the pores in the membrane toward its colder side and leaves the salt behind, condensing as fresh, cool water. This takes far less energy than simply boiling all of the saltwater because there's no need to maintain a high temperature for more than a thin layer of water at a time. This method filters about 20 kilograms of water per square meter of membrane per hour.

Alternative Energy

A research group from Chalmers University of Technology, Sweden, [has developed a specialized fluid](#), called a solar thermal fuel that can store energy from the sun for well over a decade. This molecule is composed of carbon, hydrogen and nitrogen, and when it is hit by sunlight, it does something unusual: the bonds between its atoms are rearranged and it turns into an energized new version of itself, called an isomer. Like prey caught in a trap, energy from the sun is thus captured between the isomer's strong chemical bonds, and it stays there even when the molecule cools down to room temperature. When the energy is needed – say at nighttime, or during winter – the fluid is simply drawn through a catalyst that returns the molecule to its original form, releasing energy in the form of heat. The fluid can now hold 250 watt-hours of energy per kilogram, which is double the energy capacity of Tesla's Powerwall batteries.

The promising solar cell materials called perovskites [need a partner](#). Researchers marry a layer of perovskite, which absorbs high-energy blue photons in sunlight, with standard silicon, which gobbles up lower-energy light. The team's perovskite converts light instead of generating current, transforming blue photons to near-infrared (near-IR) photons, which the silicon cell below

then turns into electricity. The researchers say the design could boost the efficiency of silicon solar cells by nearly 20%.

A [new-generation direct-drive permanent magnet generator](#) (PMG), developed by **British start-up Greenspur Renewables**, uses ferrites – an iron-rich ceramic – for its magnets rather than current go-to rare-earth materials and is built around a modular architecture, making it scalable and easy to repair and maintain. Replacing high-price rare-earth materials with ferrites would cut the cost of PMG magnets from £40 (\$50) a kilogram (kg) to around £1/kg.

Stanford scientists have [outlined roadmaps](#) with steps that 143 countries around the world can take to attain 100% clean, renewable energy by the year 2050. The roadmaps call for the electrification of all energy sectors, for increased energy efficiency leading to reduced energy use, and for the development of wind, water, and solar infrastructure that can supply 80% of all power by 2030 and 100% of all power by 2050. All energy sectors includes electricity; transportation; building heating and cooling; industry; agriculture, forestry, and fishing; and the military. They project that transitioning to clean renewable energy could reduce worldwide energy needs by 57%.

Lenex damless mini HPP generates 11 kW per hour at a river flow rate of 1 m/s. It is based on a unique method of energy production from any kind of water source (rivers, streams, tides, sea waves, etc.), as well as from the movement of air masses, which was not previously used in any of the existing structures. In this case, a natural flow is used without prior transformation (construction of dams, channels, pressure pipes).

Belgian engineering innovators Jasper Verreydt and Geert Slachmuylders have developed a revolutionary mini HPP model. Called Turbulent, these engineering innovators are working on small scale 3D printed turbines that can generate enough power from a single small river or stream to sustain a few families. In fact, these small hydropower plants can be placed in small rivers with a height difference of just 2 m (thus not blocking a river's natural function like a dam does), and generate up to 200 kW.

German engineer Andreas Zelseimayer has developed a compact mobile HPP "Rotor", which will be able to provide electricity to a small rural settlement. The heart of the "Rotor" is the Darrieus rotor, which is characterized by a high specific speed at low flow velocity. The vertical axis of the three-bladed turbine wheel is

mounted in the center of the inflatable rubber bladder, and the rotational energy is transmitted to a specially designed generator. The key

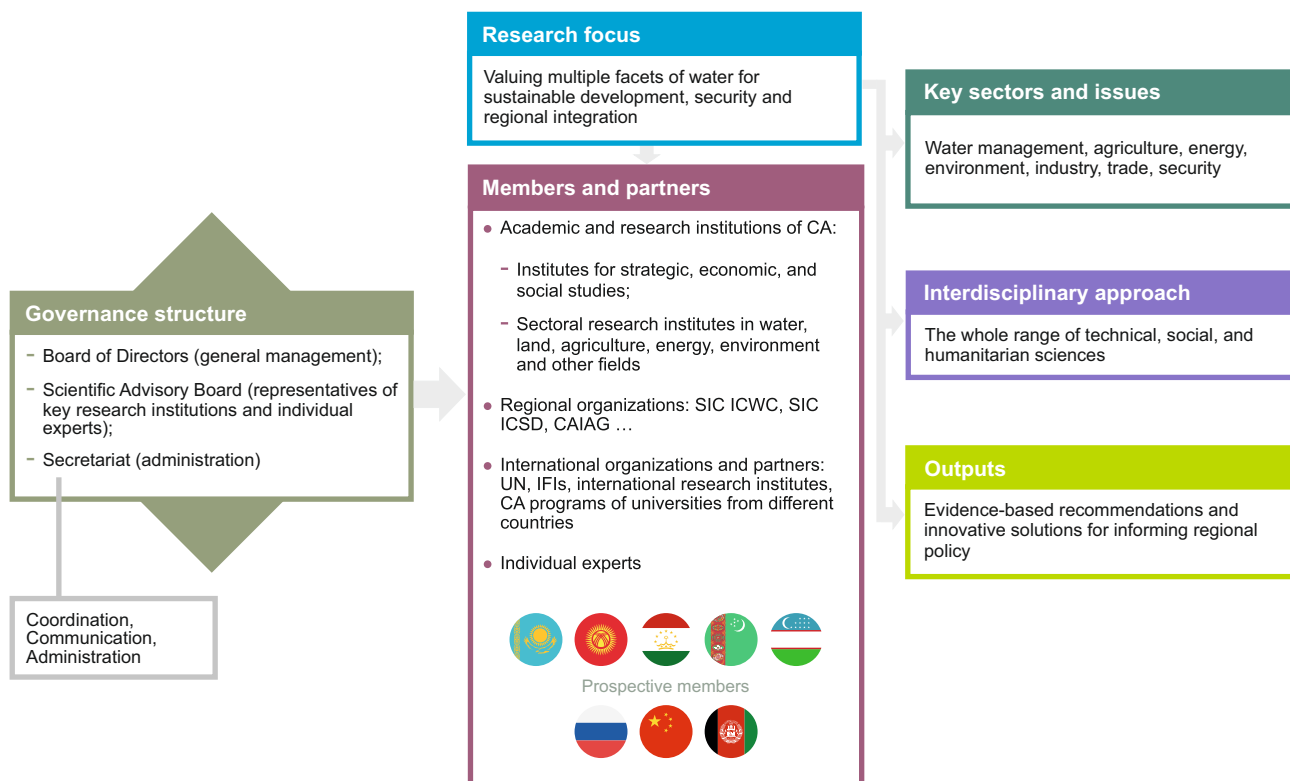
advantages of “Rotor” are simplicity, reliability, and low cost. No special skills are required for installation and maintenance.

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

President Sh.M. Mirziyoyev at the IFAS summit in Turkmenbashi on August 24, 2018 stated that it was impossible to find solutions for current problems without effective scientific cooperation and therefore considered it imperative to conduct joint interdisciplinary research, including at the platform of the scientific information centers of ICWC and ICSD. In this context, EECCA NWO, Water Partner Foundation (The Netherlands), and SIC ICWC proposed to establish a Central Asia Expert Platform on Water Security, Sustainable Development, and Future Studies.

The Expert Platform is to serve as a regional think tank for applied multidisciplinary research aimed at elaborating a common development vision and joint investment solutions in Central Asia. It is not to replace or duplicate activities of existing institutions but to fill the gap in integrated approaches and expert assessments and engage new spheres of knowledge. To achieve this mission, the Platform will:

- bring together **leading experts** from different disciplines and countries;
- perform **cutting edge research** on an agreed work program;
- deliver high-quality **expert assessments** to demonstrate new opportunities and prospects for sustainable development in the region;
- contribute to strengthening **education** in the field of sustainable development;
- **cooperate** with different partners, including international research centers;
- promote **shifting from traditional narrow sectoral approaches** by opening opportunities for professionals from different fields (agriculture, water, energy, environment, and climate) and disciplines (engineering, law, economics, social sciences, data and knowledge management, international relations, etc.) and work together to find compromise solutions and innovative approaches.



Source: SIC ICWC

10.3. Leading research institutes of EECOA countries

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

RUE CRICUWR was established in 1961. It is subordinated to the [Ministry of Natural Resources and Environmental Protection of the Republic of Belarus](#) (since 1994) and is the back-up organization of the Ministry for development of river basin management plans, inventory of national surface water bodies, schemes and projects of water protection zones and coastal strips of waterways and reservoirs, zones of sanitary protection of surface and groundwater intakes. It performs the functions of the head organization for maintaining the State Water Cadaster (SWC), provides information services to the economic sectors with data on water bodies, water resources, regime, quality, water use and wastewater discharge; exchanges data with neighboring states (on transboundary watercourses) and prepares information materials on water resources and their use for international organizations. The institute annually undertakes about 115-120 research and development activities.

Activities in 2016-2019

- River Basin Management Plans have been developed for the Dnieper, Western Bug and Pripyat, including identification and typology of surface and groundwater bodies, assessment of the ecological status of surface water bodies, assessment of anthropogenic load on surface and groundwater bodies from point and dispersed sources of pollution and development of measures to achieve good ecological status of surface water bodies and good quantitative and chemical status of groundwater bodies.

- As to integrated assessment and forecast of water changes, (1) a draft Strategy for Water Resources Management in the Context of Climate Change for the period up to 2030 and an Action Plan for its implementation were prepared; (2) a catalog of promising sites for hydropower units to use potential of medium and small rivers in the basin of the Western Dvina, Dnieper and Pripyat Rivers was compiled for inclusion in the database of the State RES Cadaster; (3) an experimental sample of a program software was developed for monitoring channel processes and river hydrological regime using remote sensing data; (4) a program of measures to reduce negative consequences of changes in hydromorphological, hydrologic and hydrochemical parameters of the Western Bug River, flood risk and mitigation maps for the transboundary section of the river, as well as programs to

restore small watercourses within large settlements for the Usha (Molodechno), Druchanka (Novopolotsk) and Debrya (Mogilev) Rivers were developed; (5) the parameters of the hydrological regime of the Viliya River were assessed, including in a transboundary context and taking into account the needs of the technical water supply of the Belarusian NPP; calculations of the water balance of the Viliya River were made (before and taking into account the operation of the Belarusian NPP); (6) hydraulic calculations of the wave motion during the breakthrough of the Zaslavskoye dam were performed; schemes of zones of possible flooding were developed, with the identification of objects falling into these flooding zones; (7) an assessment of the impact of absorption fields on the state of water resources was made, a list of absorption fields with the greatest negative impact on the state of water resources was substantiated, and regional measures for their decommission were developed, as well as evidence-based proposals to define criteria for additional inclusion of absorption fields in the National Environmental Monitoring System as objects of local groundwater monitoring; (8) work was done to develop national indicators for SDGs 6.2-6.5 “Ensure availability and sustainable management of water and sanitation for all”, methods for their definition and mechanisms for monitoring their implementation; (9) the current state of water resources in the Republic of Belarus was assessed, the forecasts of water use and state of aquatic ecosystems for the period up to 2035 and proposals on water resource use and aquatic ecosystem protection were developed for the draft Environmental Protection Strategy of the Republic of Belarus for the period up to 2035; (10) hydrodynamic calculations of the wave motion during the breakthrough of sludge storage dams at JSC “Belaruskali” and mapping of the boundaries of possible flooding with the identification of objects falling into these flooding zones were made; (11) mathematical modeling of pollutant transfer along the Berezina and Dnieper Rivers was performed, and transboundary impact (surface water) of design solutions was assessed for the project “Construction of the Sulphate Bleached Cellulose Plant at the Svetlogorsk Pulp and Cardboard Mill”, etc.

- A catalog of water protection zones and coastal strips has been developed, and it is systematically filled in with the results of the water protection zone and coastal strip projects.

Capacity building. RUE CRICUWR is constantly working on training highly qualified scientific personnel. Currently, training, through [postgraduate studies](#), is carried out in the following areas: 03/25/05 “Land hydrology, water resources, hydrochemistry” (technical sciences) and 03/25/13 – “Geoecology” (technical sciences).

In 2019, the Institute's staff took part in more than 120 congresses, forums, conferences, seminars, public hearings, working meetings, including 10 international conferences. RUE

CRICUWR actively participates in various international projects, has a number of agreements on scientific and technical cooperation with counterpart organizations in Russia, Ukraine, Germany, etc., and is an active partner from Belarus in the implementation of the International Technical Assistance Project “European Union Water Initiative Plus for the Eastern Partnership (EUWI+4EaP)”.

Source (in Russian): RUE CRICUWR, <http://www.cricuwr.by>

Kazakhstan. Kazakh Scientific Research Institute of Water Economy (KazSRIWE)

[KazSRIWE](#) was established in 1950 and is one of the leading scientific organizations in the field of water management, land reclamation, irrigation, and agricultural water supply in the Republic of Kazakhstan. The main directions of the Institute's activity are as follows: elaboration of methodology and ways for sustainable development of land reclamation and water sector; improvement of organization of water supply in the agroindustrial sector based on international standards; development of integrated water resources management methods; ensuring safety of water management systems and hydraulic facilities; improvement and adaptation of resource-saving technologies to reclaim poor lands; development of innovative water-saving irrigation technologies and techniques; development of measures for agricultural water supply and pasture watering for distant livestock breeding; environmental and economic justification of establishing clusters in irrigated agriculture; transfer of advanced international technologies and personnel support; and international cooperation with leading international scientific and educational centers. Research and development efforts are undertaken and irrigation technologies and techniques are adjusted at the pilot field in the Besagash village, Zhambyl province. There is an experimental workshop for production of prototypes and laboratory installations on the basis of KazSRIWE.

Among the latest developments are the hydram and the water level sensor 2/0.005-10, which allows for continuous and automated water accounting at gauging stations. Measurements are taken without contact with water by means of ultrasonic distance meter. It has an independent power supply; online data transmission is made via the built-in SIM-card. As part of the Program “Adoption and dissemination of automated water control technology at the Bugunskoye reservoir”, water accounting and water distribution were automated using the 2/0.005-10 sensor at 16 gauging stations along the Arys-Turkestan canal and the Turkestan main canal.

In 2019, the Institute's staff took part in the Regional Central Asian Conference “Innovative Approaches and Solutions for Sustainable Water Management and Possibilities of their Use under the Central Asian Conditions” (December 18-19); [regional workshop](#) “Towards Regional Initiatives for Modernizing Irrigation in the 21st Century” organized by WB with the support of EU, Switzerland, and UK (November 19-20, Almaty). KazSRIWE also took part in organization of seminars in the format of “Field Day” (1) for Zhambyl agrarians (2) “Technology of maize growing on degraded soils” on the pilot field of the Institute (July).

Source: <http://www.kaziwr.isd.kz/page.php?lang=2>

Kyrgyz Republic. Kyrgyz Irrigation Research Institute

The Institute was established in 1953 on the basis of the Kyrgyz branch of the Academy of Sciences. In 1973, the Institute received the status of the All-Union Research Institute of Integrated Automation of Reclamation Systems, it coordinated and implemented water developments in USSR and abroad on the latest technologies in

land reclamation, automation and telemetry of irrigation and drainage systems, as well as on automated water intake and distribution control systems. In 1992, the Institute was transformed into the [Kyrgyz Irrigation Research Institute](#) and currently is a part of the Kyrgyz National Agrarian University named after K.I. Skryabin.

The Institute conducts research in land reclamation and irrigated agriculture fields and provides technical and information support. It offers practice-oriented classes for students of the Hydro-melioration, Ecology and Land Management Faculty of KNAU in the areas of construction (hydraulic engineering), environmental engineering and water use.

In 2019, the Institute's staff took part in the [regional workshop](#) "Towards Regional Initiatives for Modernizing Irrigation in the 21st Century" organized by WB (November 19-20, Almaty); IV International Scientific and Practical Conference "Food Security, Soils and Climate-Smart Agriculture" (December 5-6, Sochi, Russia), etc.

Source: <http://knau.kg/en/institutes/kyrgyz-research-irrigation-institute>

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

RosNIIVKh was founded in 1969. It consists of the lead institute (FSBI "RosNIIVKh", Yekaterinburg) and branches: Eastern ("VostokNIIVKh", Chita), Far Eastern ("DalNIIVKh", Vladivostok), Kamsky ("KamNIIVKh", Perm), and Bashkir ("BashNIIVKh", Ufa).

In September 2019, RosNIIVKh celebrated its 50th anniversary. The Institute has considerable experience in the development and formulation of a conceptual framework of water management and of national water governance improvement strategy and largely contributed to the formation of the school of water sciences. Research and development of the Institute are aimed at solving tasks defined by the Water Strategy of the Russian Federation; cover a wide range of issues related to strategic and operational water management and planning, technologies for rehabilitation of water bodies, modeling and forecasting of the status of water bodies.

The Institute actively collaborates with other institutions, is a member of the European Water Association (EWA), the European Center for River Restoration (ECRR), and the Eastern Europe, Caucasus and Central Asia Network of Water-Management Organizations (EECCA NWO). Branches of the Water Management and Water Technology Department of the Ural State Technical University (training in Integrated Water Use and Protection) and Land and Environmental Law Department of the Ural State Law Academy (training of environmental lawyers) were established at the lead institute.

RosNIIVKh publishes the "Water Sector of Russia: Problems, Technologies, Management" journal and "Water of Russia" newspaper (<http://www.waterjournal.ru>).

Activity in 2019

As part of State assignments:

■ the following activities were performed: (1) research on the improvement of public po-

licy in the field of water use and protection, particularly related to water, energy, food and environment nexus at the national level; as a result, the basic model of water governance was proposed; (2) scientific, methodological and information support to the Federal Water Resources Agency in the fields of rational use and protection of transboundary water; (3) assessment of river channel processes in the most stressed reaches of the Kama River basin and development of recommendations for further monitoring to minimize the negative effects of harmful water impacts; (4) research of water risks in the border section of the Argun River (from Abagaytuy village to Argunsk village) and development of proposals for their management; (5) research of water regulation and quality regime in the Pavlov reservoir and its impact on the lower reaches of the Ufa River over the past 20-30 years with the development of scientifically based recommendations and measures to improve water supply of the city and reduce floods; (6) information support to the "Hydrodynamic model of flood wave propagation in the main channel of the Amur River"; (7) information support to the procedure of licensing the use of water bodies in the control area of the Amur Basin Water Authority.

■ the following documents were developed: (1) Guidelines and procedures for rehabilitation of surface water bodies; (2) draft Guidelines on assessment of self-cleaning capacity of water bodies; (3) Guidelines on assessment of the condition of water bodies from an environmental perspective; (4) Program for rehabilitation of tributaries of the Tura River; (5) Guidelines on determination of allowable chemical influx into water bodies characterized by moderate to slow water exchange; (6) scientifically grounded indicators of admissible impacts on coastal areas (case study of the Peter the Great Bay, Primorsky Krai) and recommendations for mitigation of anthropogenic impact on water area; (7) Proposals for improved monitoring of water bodies, including observations of the bottom,

banks, conditions and regimes of water protection zones.

- Prospective and specific R&D areas were justified for inclusion into the “Research Program in the Field of Management of Water Use and Protection up to 2030”.

As part of contractual work, the Institute:

- developed: (1) recommendations for selection of measures aimed at protecting surface water from diffuse pollution (case study of small rivers in the Chusovaya River Basin); (2) methods for calculation of infiltration and evaporation to calculate water balance of the “White Sea” sludge collector; (3) cost estimate for current repair of hydraulic facilities served for engineering protection of the Chita city from flooding; (4) scientifically grounded measures for environmental rehabilitation of water bodies in the area of the Shemur, Novo-Shemur and Tarnier deposits, the scheme and frequency of their monitoring.

- carried out: (1) research of the environmental situation in the Upper Tagil reservoir to assess the impact of the thermal power plant; (2) engineering and hydrometeorological surveys at the Bystrinsky mining and processing plant; (3) inventory and technical inspection of hydraulic facilities in the Zabaykalsky Krai with recommendations for further repair or reconstruction; (4) hydromorphological monitoring of surface water in the Sverdlovsk province (Chernoistochinsk, Volchikhinsk reservoirs, Lake Shartash).

RosNIIVKh provided information and organizational and technical support to the Federal Water Resources Agency in the 15th International Scientific and Practical Symposium and Exhibition “Clean Water of Russia-2019”. At the end of the event, proceedings of the Symposium were published (September 23-27, Yekaterinburg).

In 2019, 6 issues of the “Water Sector of Russia: Problems, Technologies, Management” journal were published and included 13 scientific papers of the Institute's researchers.

Source (in Russian): RosNIIVKh, www.wrm.ru

Tajikistan. State Enterprise “Tajik Research Institute of Hydraulic Engineering and Amelioration” (SE “TajikNIIGim”)

SE “TajikNIIGim” was established in 1978 as a branch of VNIIGIM named after A.N. Kostyakov. The Institute was transformed into SPA “TajikNIIGim” in 1994 and got the status of state institution in 2007.

Since March 2014, the Institute has been functioning under the auspices of the Ministry of Energy and Water Resources of Tajikistan. The Institute includes Scientific and Production Centers of Sogd, Kurgantube, Zh.Balkh and Gissar, where research is carried out and new irrigation technologies and techniques are tested at pilot sites.

The Institute carries out fundamental, exploratory and applied research in the following areas: (1) formation of environmentally sustainable agro-landscapes, comprehensive reclamation of land, hydraulic engineering, hydraulics and engineering hydrology, mechanization and automation of construction, reconstruction and operation of reclamation systems, economic methods of water use regulation; information and environmental protection technologies, organization of scientific and technical support; (2) development of comprehensive reclamation processes ensuring highly efficient and eco-friendly agricultural production; (3) improvement and development of new resource-

and nature-saving irrigation and drainage technologies, information technologies; (4) monitoring of reclaimed land, techno-natural systems, and agricultural land, restoration and management of reclaimed agricultural land productivity; (5) development of ways for improving efficiency of water and land use and protection in the agro-industrial sector; (6) reclamation of degraded (eroded, contaminated, salinized) land and development of resource-saving technologies to increase their productivity.

The Institute maintains collaboration with more than 30 national and international scientific institutions. TajikNIIGim is a member of EECCA NWO and participates in implementation of GWP CACENA programs.

Capacity building. In 2019, TajikNIIGim held a round table “Raising Awareness of Decision Makers about Implementation of IWRM Mechanisms in the Tajik territory of the Syr Darya River Basin” (September 24, Gulistan, Sogd province); trainings within the project “IWRM: Theory, Practice and Perspectives in the River Basins of Tajikistan” (June 10-13, in each watershed of Aksu-Isfana-Tomchasay-Khodja-Bakirgan-Arkasay sub-basins; November 4-8, Matcha, B. Gafurov districts and Kani Badam and Istaravshan towns of Sogd province).

The Institute's Advanced Water Training Department, established with the support of the Ministry of Energy and Water Resources of the Republic of Tajikistan in 2016, develops training programs and modules and organizes training courses. In particular, training modules were developed on operation of hydraulic facilities and the inter-farm network for dekhkan farms, WUAs, and sub-divisions of the Agency for Land Reclamation and Irrigation.

The Institute's staff participated in various events, including a webinar "Climate Change and Water Resources in the Region" (July 2); [regional workshop](#) "Towards Regional Initiatives for Modernizing Irrigation in the 21st Century" organized by WB (November 19-20, Almaty).

Source (in Russian): www.niigim.tj/index.php

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

The Institute was founded in 1929 as the Institute of Hydraulic Engineering and Land Reclamation and was renamed to IWPLR in 2011. It works in the system of the National Academy of Agrarian Sciences of Ukraine. The Institute conducts fundamental and applied research on hydraulic engineering, irrigation and drainage, water management, agricultural water supply and sewerage, environmental problems of land reclamation, environmental monitoring, develops designs of reclamation systems, automated control systems, technologies, techniques for irrigation mechanization, operation of irrigation and drainage systems and effective use of reclaimed land.

The scientific staff of IWPLR and its research network is composed of 117 people, including 12 doctors and 46 candidates of science. The Institute includes research stations (Sarnensk and Kamensk-Dneprovsk), experimental farms (Southern State Agricultural Experimental Station and State Enterprise "Experimental farm "Brilov"), Central Laboratory of water and soil quality, and design-technological bureau.

Activity in 2019

Comprehensive monitoring was performed to identify causes of water level lowering in Lake Svitiyaz and shallowing of Shatskyi lakes (www.golos.com.ua/rus/article/326459); the Strategy for Restoration and Development of Irrigation and Drainage in Ukraine until 2030 and the draft Law of Ukraine "On association of water users" were developed.

Scientific and technological collaboration is maintained with the CIS countries, a number of companies and scientific centers in the US, Germany, Italy and the Netherlands. In cooperation with the Mugla University (Turkey), diffuse pollution in the river basins of Ukraine and Turkey is modeled. The International Scientific and Practical Conference "Water for All" was held jointly

with RUE CRICUWR, Belarus and GWP Ukraine (March 21).

Capacity building. IWPLR trains scientific personnel through postgraduate and doctoral programs with on-the-job and off-the-job training in the following specializations: 06.01.02 – agricultural land reclamation (technical sciences), 06.01.02 – agricultural land reclamation (agricultural sciences), 201 – agronomy, and 192 – construction and civil engineering.

Within the framework of the "Integrated Natural Resources Management in Degraded Landscapes in the Forest-Steppe and Steppe Zones of Ukraine" project (FAO/GEF), IWPLR conducted (1) training courses for agronomists and farmers on "Subsurface Drip Irrigation Technologies in the No-till Farming System", "Impact of Sustainable Agricultural Management on Soil Quality and Crop Productivity" (July 19) and "Windbreaks and their Importance in the Zone of Risky Farming" (December 11); (2) workshops on "Ways and New Horizons of Reclamation Science Development" (August 29); on raising awareness and evaluating implementation and monitoring of SDG 6 (September 6). Within the framework of the EU4Business initiative with the support of EBRD, EU together with ValeurTech (France) developed a professional theoretical and practical course on "Irrigation Management in Drip Irrigation and Sprinkling" and conducted the first practical training (March 16-17, 2020, Nikolaev).

In 2019, the director of IWPLR was awarded the highest award of the National Academy of Agrarian Sciences "For scientific achievements".

Source (in Ukrainian): http://igim.org.ua/?page_id=2

Uzbekistan. Research Institute of Irrigation and Water Problems (RIIWP)

RIIWP is the largest research institution in the field of water management and land reclamation in Uzbekistan. It carries out research on current and strategic issues related to water management and provides scientific support for the improvement of water use efficiency as part of its operational tasks and contractual work.

The total staff is 112 people, including 82 researchers, with 31 ones holding academic degrees. There are 2 doctors (Dsc), 10 PhDs, and 16 independent applicants. During 2018-2019, 10 PhDs and 2 DSc were graduated (theses were submitted to the Academic Council).

In recent years, RIIWP:

- provided (1) recommendations for safe and reliable water diversions from the transboundary Amu Darya to ensure sustainable water supply to Surkhandarya, Kashkadarya, Bukhara and Navoyi provinces in Uzbekistan. The recommendations determined protection measures against potential negative external impact on the flow of the Amu Darya, as well as justified a new canal route to shift water supply from pumping to gravity option, which will reduce energy costs for pumping irrigation down to 30% and create conditions for good quality drinking water for over 10 million people in southern regions of Uzbekistan; (2) scientific rationale of parameters for possible mobilization of a portion of river flow (up to 2 km³/year) from idle discharge in the middle reaches of the Syr Darya (Chirchik-Akhangaran irrigation district) for the needs of the Republic;

- developed: (1) Draft Strategy for Water Management and Land Reclamation in the Republic of Uzbekistan for the period up to 2030 and priority measures for its implementation; (2) scientifically grounded parameters of safety of the

Tupolang dam and reservoir, capacity of 0.5 km³, of increased capacity of the Tupolang HPP to 185 MW and of a new cascade of Zarchob HPPs (at the Tupolang River) with the total capacity of 75 MW, etc;

- created new designs of: (1) water and gas meter for pressure pipelines; (2) soil moisture meters with software and local action for online adjustment of crop irrigation regime;

- developed new construction materials that are widely used for repair and rehabilitation of irrigation networks and other water management infrastructure through partial use of industrial production: sealing bitumen-polymer mastic, waterproofings for abutting joints and control joints, concrete and reinforced concrete coatings, as well as bentonite hydromates for anti-filtration measures along canals, which provide 10-20-fold reduction in material intensity as compared to concrete and 6-7-fold reduction in structural water losses;

- developed and implemented Basin Information System "BIS" at BISAs⁸¹. It provides daily accounting of water supply and waste discharge in Uzbekistan for decision-making on water management and improvement of irrigated land on the area of 350,000 ha, and offers other services.

At present, a number projects are implemented: (1) 21 projects, including 5 fundamental, 14 applied and 2 innovative research through the state budget (3.7 billion UZS); (2) 12 projects through (contracts) extra-budgetary funds (1.2 billion UZS); (3) 2 projects through international grants (US\$170,000).

Source: RIIWP

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

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

The Central Asia Research Group of the Leibniz Institute of Agricultural Development in Transition Economies (IAMO) is a cross-departmental network of scientists conducting research on interdisciplinary topics related to agricultural trans-

formation processes in the five Central Asian countries. The research interests and expertise of the Research Group encompass a wide range of topics, including natural resource management, supply chain transformation, risk management, agricultural policies and institutions, climate change and migration. The Group applies modern quantitative and qualitative methods using

⁸¹ Basin Irrigation System Administration

the data from longitudinal, cross-sectional and thematic studies. Particular attention is paid to collection and integration of input data. Group's state-of-the art, multidisciplinary research is targeting not only a research audience but also aims at policy-impact and scientific transfer into the economic sphere. In addition to research, they put a particular focus on knowledge transfer and capacity building in the region. Through postgraduate programs in Germany and Central Asia, the Group improves professional skills of young scientists from the region, strengthens the regional research system and develops scientific cooperation with and within the region.

Source: <https://centralasia.iamo.de/home>

The Central Asia Regional Economic Cooperation (CAREC) Institute is an intergovernmental organization dedicated to promoting economic cooperation in Central Asia and along the Silk Road through knowledge generation and sharing. The Institute is headquartered in Urumqi, Xinjiang Uygur Autonomous Region, and the People's Republic of China (PRC) since 2015.

The CAREC Institute is jointly shared, owned, and governed by eleven member countries: Afghanistan, Azerbaijan, the PRC, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. It is a knowledge support arm of the CAREC region.

The Institute acts as a knowledge connector among the five CAREC themes: (1) economic and financial stability; (2) trade, tourism, and economic corridors; (3) infrastructure and economic connectivity; (4) agriculture and water; (5) human development.

Its Annual Report 2019 is available on: www.carecinstitute.org/wp-content/uploads/2020/03/RUS-CAREC-Institute-Annual-Report2019-30-Mar-2020.pdf

Source: www.carecinstitute.org





Section 11

Key Water
Developments
in the World

11.1. Africa

Construction of the Grand Ethiopian Renaissance Dam on the Nile River in Ethiopia. As of the end of 2019, the dam is 70% complete. According to Ethiopia, no one can halt the project, but Egypt is concerned about the dam's impact on its water resources and with how much water will be used by Sudan. [In October](#), Egypt said that talks with Sudan and Ethiopia have reached a deadlock, and it called for international mediation and help in reaching a fair and balanced agreement. [On 6 November](#), the Foreign Ministers of Egypt, Ethiopia agreed to work toward completion of an agreement by 15 January 2020, and would attend two meetings in Washington, D.C. on 9 December 2019 and 13 January 2020 to assess and support progress. If an agreement is not reached by 15 January 2020, the foreign ministers agree that Article 10 of the 2015 Declaration of Principles will be invoked. Article 10 stated that "The Three Countries will settle disputes, arising out of the interpretation or implementation of this agreement, amicably through consultation or negotiation in accordance with the principle of good faith." The foreign ministers noted their agreement to hold four technical governmental meetings at the level of water ministers. The ministers agreed that the World Bank and the United States would support and attend the meetings as observers. [On 9 December](#), the Ministers of Foreign Affairs of Egypt, Ethiopia and Sudan met again through the USA and the World Bank. They noted the progress achieved in the technical meetings among the Ministers of Water Resources in Addis Ababa and in Cairo. The Ministers agreed that the strategic direction of the next two technical meetings should be the development of technical rules and guidelines for the filling and operation of the Grand Ethiopian Renaissance Dam, the definition of drought conditions, and drought mitigation measures to be taken.

Source:
<https://home.treasury.gov/news/pressreleases>

Developments with the Inga III project on the Congo. With a capacity of 11,000 MW, the Inga III project is part of Grand Inga, a series of dams designed to exploit up to 40,000 MW of electricity from the Congo River. If successful, Inga III will become the largest hydropower plant in sub-Saharan Africa. Its development was entrusted by the Congolese government, in October 2018, to two international consortia, led by China Three Gorges Corporation and Spanish construction firm ACS. In October 2019, a [report](#)

published by the Congo Research Group and Resource Matters revealed serious disagreements between groups of Spanish and Chinese developers on the constitution of a joint consortium, required by the Congolese presidency, to carry out the project. This report also demonstrated how the Inga III project, which was being negotiated behind closed doors, was intended for outside consumption and did not guarantee access to electricity for the millions of Congolese who are forced to go without. The report criticized the Inga III process for its lack of inclusion and transparency, and in particular the uncertainty that it will address the crippling energy needs of 90 million Congolese. In [November 2019](#), the South African parliament has heard a submission from two leading civil society organizations, calling for them to stop government funding to the Grand Inga Dam Project. The South African government signed a treaty and Memorandum of Understanding with the DRC government, committing the country to buying 2500 MW of electricity from the hydropower and paying for the transmission lines from DRC to South Africa.

Construction of the Isimba HPP on the Nile River in Uganda. In 2019, the World Bank Inspection Panel completed its Investigation Report regarding the Bank-financed Uganda Private Power Generation (Bujagali), Water Management and Development, and Energy for Rural Transformation III Projects. The Request for Inspection was submitted by members of the community from the Kalagala Offset Area (KOA) in Uganda. The complainants raised concerns about potential social and environmental harm caused by the construction of the Isimba Dam and the consequent flooding of the KOA. The Panel's investigation found the World Bank in non-compliance with its policies on Environmental Assessment, Natural Habitats, Project Supervision and Investment Project Financing, observing that the Bank did not address funding and capacity constraints to ensure the maintenance of the KOA. On 3 December 2019 the Board of Executive Directors considered the Panel's report and approved the Management Action Plan, which details how the World Bank and Uganda will work together to protect the extended KOA.

Source:
www.inspectionpanel.org/panelcases/private-power-generation-bujagali-watermanagement-and-development-and-energyrural?deliveryName=DM46019

Impact of the 2018/19 drought on the Zambezi River. The Kariba dam, the world's biggest man-made reservoir, was close to decommissioning. As of 26 [November](#) 2019, water levels at Kariba Dam receded to the danger mark of 477,19 metres above sea level (57% full), which were just about two metres above the minimum water generation threshold required to turn the turbines. In this situation left the [Zambezi River Authority](#) (ZRA) with no option than to reduce water volumes for Zambia and Zimbabwe's hydro-power generation, on which the two countries depend on for most of their electricity supply. The dire situation has come at a time when South Africa's power utility, Eskom, a major supplier of electricity to Zimbabwe, is also facing a critical shortage of power. Currently Zimbabwe and Zambia are planning another power project upstream on the Zambezi, [Batoka Gorge Hydro-Electric Scheme](#), to address electricity shortages. In 2019, ZRA chose a consortium of Power Construction Corporation of China Ltd. and General Electric of US on a build, operate and transfer financial model of this the US \$4 billion project. The project will generate 2,400 MW of electricity to be shared equally by two countries and feed into the regional grid. In [December](#) 2019, the Council of Ministers of the ZRA has also said it is considering alternative sources of energy such as solar as back-up in light of perennial low inflows into the Kariba Dam, which needs three rainfall seasons to fill up.

Sources: www.zimetro.co.zw/kariba-dam-waterlevels-further-recede;
www.chronicle.co.zw/ministers-zra-mull-alternativeenergy-sources/

The Victoria Falls became shallow. The flow of Victoria Falls, with a height of roughly 108 metres, has been reduced to a trickle. Zimbabwe officials say drought had reduced water levels at the falls to their lowest in 25 years. Photos of the waterfall at the beginning of the year and at the end, when water level decreased, are presented further.

Source:
<https://indianexpress.com/article/explained/explained-why-victoria-falls-are-down-to-a-trickle-6156281/>

Swedish-owned Ngonyezi Projects has entered into a non-consumptive water use agreement with Zimbabwe National Water Authority, which will see the installation of a 2,000-MWh Pumped Storage Hydro facility and 300-MW floating solar PV plant. In terms of the design, it is anticipated that the solar PV project will require 500 ha of reservoir surface for solar panels. The water will cool the panels, providing higher efficiency,



Victoria Falls
Credit: Reuters, 17 January 2019



Victoria Falls
Credit: Reuters, 4 December 2019

and the panels covering the surface water will reduce algae growth and evaporation by 20 million m³/year.

Source:
<https://www.hydroreview.com/2019/11/18/zimbabwe-includes-pumped-storage-hydro-in-renewable-energy-strategy/#gref>

In July 2019, Tanzanian President John Magufuli officially inaugurated the construction of the 2,115 megawatts Nyerere Hydropower Project located along the Rufiji River, previously known as the Stigler Gorge Project. The dam will be fourth largest in Africa and ninth largest in the world. The power station is expected to produce 5,920 GWh of power annually. The US \$3-billion project at Stiegler's gorge inside the Selous Game Reserve, a UNESCO World Heritage site, is being jointly built by two Egyptian companies, Arab Contractors and El Sewedy Electric Co, which are intermediary firms for actual contract with [PowerChina](#). The World Heritage Center, IUCN, the WWF, and local groups called for a complete stop to dam construction and forest clearing; restoration of the World Heritage site; and consideration of more sustainable energy sources. An [independent technical review](#)

commissioned by IUCN concluded that the strategic environmental assessment of the Rufiji hydropower project inside the World Heritage site falls “fundamentally short of both international and national guidance for a [strategic environmental assessment]”. The [World Heritage Committee](#) has urged Tanzania not to proceed with it. At its session in Baku in July 2019, the Committee concluded that the project would likely lead to irreversible damage to the site’s Outstanding Universal Value and hence fulfil the conditions for removal of the property from the World Heritage List, in accordance with Paragraph 192 of the Operational Guidelines.

Sources: www.xinhuanet.com/english/2019-07/27/c_138261370.html;
www.iucn.org/news/world-heritage/201912/iucn-outsourced-paper-finds-no-proof-rufiji-dam-project-can-meet-tanzanias-development-needs;
www.transrivers.org/2019/2661/

Ghana plans more mini hydropower plants across the country to increase power supply from the national grid. The Minister for Energy said this when he inspected completed works on the construction of civil structures of a 42-kW Tsatsadu mini hydropower project at Alavanyo-Abehenease in the Volta Region. The construction of the mini hydro power plant started in 2005 but stalled before resuming in 2017. It is estimated at US \$400 thousand and, when completed, will be the first in Ghana. Generation from the plant was estimated for seven months in a year after.

Source: www.hydroreview.com/2019/09/30/ghana-announces-plans-to-build-more-mini-hydropower-plants/?topic=35309

Cape Town’s Water Strategy was approved by the City Council on 30 May 2019 following a period of public comment. The new strategy is different in that it is the first roadmap to support Cape Town in becoming more resilient to drought, climate change and other water-related shocks and stresses. At its simplest, the strategy is about avoiding another Day Zero. The strategy is also about building a more equitable, socially just city by improving access to water and sanitation – something that received limited attention during the water crisis, wise use of water, sufficient, reliable water from diverse sources, shared benefits from regional resources, and about a water sensitive city by 2040. There are three obvious indicators in the water strategy that deal with water supply, demand management and revenue collection. These indicators can be used to check on progress. The first indicator deals with alternative water sources, such as

desalination, reuse and groundwater, which by 2040 will reduce the supply of water from storage dams to about 75% as compared with the current supply of 95%. Within the second indicator, the water strategy proposes that future restrictions will be based on the volume of stored water in the dams as of 1 November at the beginning of each hydrological year. Within the third indicator, the city aims to improve its revenue collection by achieving a collection rate of 95% or more.

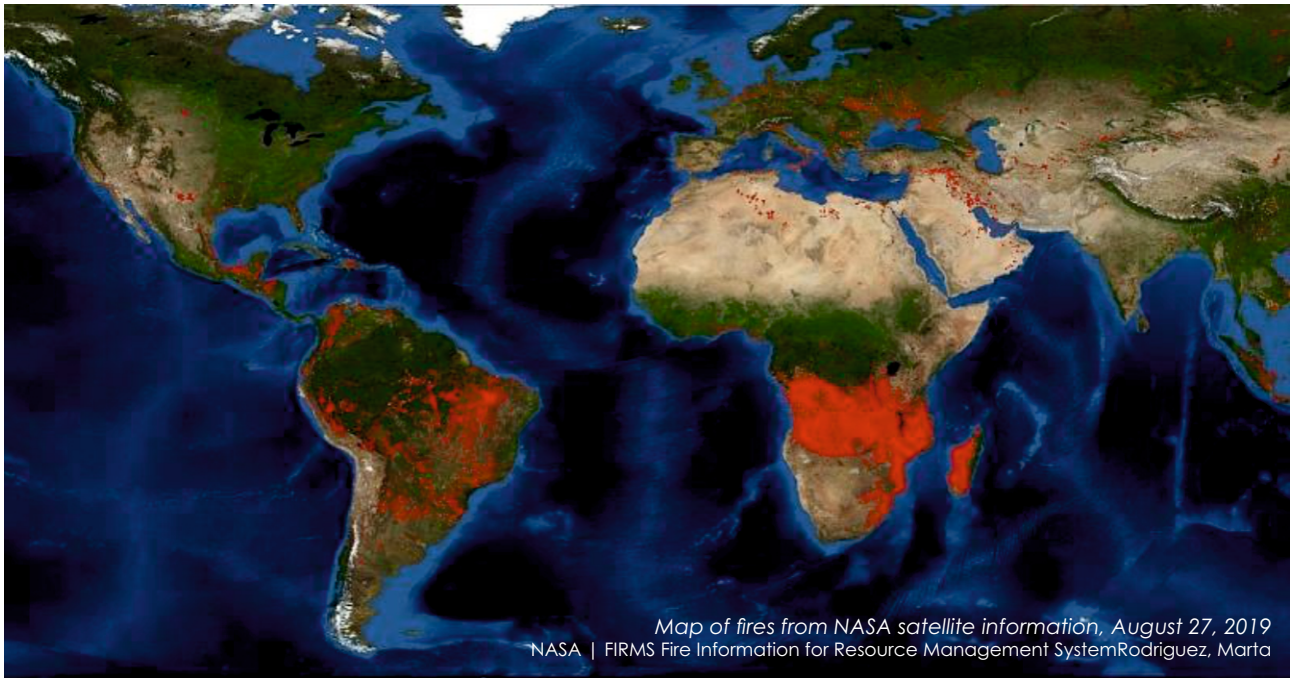
Source: www.news.uct.ac.za/article/-2019-07-22-cape-towns-water-strategy-what-to-watch

In the east of Africa, devastating floods have displaced hundreds of thousands of people. South Sudan has been swamped by more than three months of unprecedented rainfall. Over 900,000 people have been affected. Before the flooding, nearly two-thirds of the areas involved reported critical levels of malnutrition. The government of South Sudan declared a state of emergency on 26 October. In Somalia, more than half a million people suffered from flooding which has destroyed infrastructure and agriculture. In neighboring Ethiopia, over 200,000 people had to leave their homes. In Kenya, at least 17,000 people were displaced and 48 died. East Africa’s rains have been amplified by a weather phenomenon that is similar to the El Nino phenomenon in the Pacific Ocean. It’s called the Indian Ocean Dipole, and some consider its effect on South Africa to be the most powerful since 2006.

Source: www.circleofblue.org/2019/wef/whatsup-with-water-november-11-2019-legionnairesdisease-part-ii/

Wildfires in Africa. According to data from the Global Forest Watch, in August there has been far greater number of fires in DR Congo, Brazil, Angola, Zambia, and Mozambique. The fires in Africa are almost in the savannahs and not in the rainforests. According to experts, this is a natural cycle in the Savannah – much of the vegetation burns in the dry season. Much of Africa’s annual fires is the result of traditional agricultural and pastoral practices and does not affect large forest areas, but grasslands and farmland. Angola released that in recent years the country had lost a large area of native forests due to uncontrolled fires of various origins, including hunting.

Source: <https://www.euronews.com/2019/08/29/should-we-worry-more-about-the-wildfires-in-africa-or-in-the-amazon>



11.2. Asia

Afghanistan

According to the [National Statistics and Information Authority](#), the population of the country is 32.2 million people; its territory covers 652,864 square kilometers. Afghanistan's economy grew by 3.9% in 2019 driven by easing of drought conditions and rapid agricultural growth. At the same time, there is political uncertainty and security challenges in Afghanistan. Presidential elections were held in September 2019, but the results remain contested.

Droughts and floods. Afghanistan experienced the worst drought in a decade in 2018-2019 with about [13.5](#) million people severely food insecure. Several drought-affected provinces were also hit by flash floods in March and April 2019, further exacerbating the humanitarian situation. Seasonal flooding in early 2019 affected about [300,000](#) people. Of 117,000 new disaster displacements [recorded](#) in 2019, 111,000 were triggered by flooding in the western provinces of Badghis, Farah, Ghor, Helmand, Herat and Kandahar. [As of December 2019](#), millions of people are still struggling to recover from the devastating effects of the drought and flash floods. Hunger and malnutrition remain at dangerously high levels despite the passing of the drought with 14.3 million people forecast to be in crisis or emergency food insecurity in the first months of 2020. [As of June 30](#), humanitarian partners reached 5.2 million people affected by drought. Of

those reached, 452 thousand were in places of displacement, while the remainders were in drought-affected rural areas. International assistance provided to Afghanistan: [EU allocated](#) €898 thousand to assist 2,000 families in Afghanistan's western province of Badghis; [UN](#) – US \$733 million; [Japan](#) – US \$2.7 million to provide food assistance to 173 thousand vulnerable people.

Turkmenistan and Afghanistan discuss cooperation in the water management sphere. In April, the 3rd meeting of the Coordination Commission on Water Management Issues between Turkmenistan and Afghanistan was held; it considered current issues related to the development and strengthening of transboundary water cooperation between two countries. Among other topics, the sides exchanged views on the use of waters of the Amu Darya River – the “road of life” and the source of wealth for more than 25 million people living in its lower basin.

Source: <https://orient.tm/en/turkmenistan-and-afghanistan-discuss-cooperation-in-the-water-management-sphere/>

Balkh Agriculture, Irrigation, and Livestock Directorate in coordination with ICOM **launched a training program**, in which some 3,000 residents, both men and women, received water management training.

Source: <https://www.mail.gov.af/en/3000-balkh-residents-receive-irrigation-management-training>

ADB Operations in Afghanistan

Agriculture, water resources, and rural development. In 2019, the first phase of the Arghandab Integrated Water Resources Development Project started (US \$231.09 million); additional financing was provided for the Panj Amu River Basin Sector Project (US \$18.28 million); the Road Rehabilitation and Maintenance Program was continued (US \$12 million).

ADB [approved a US \\$348.8 million grant](#) to help in the development of water resources in Kandahar province through the expansion of Dahla Dam under the [Arghandab Integrated Water Resources Development Project](#) (see "[Activities of International Partners in Central Asia](#)"). Construction works will include raising the main dam, six saddle dams, spillways, and other associated structures to increase the full reservoir level by 13.6 meters and storage capacity from 288 mcm to 782 mcm.

Energy. Second Solar Energy Development Project was continued (US \$40 million); tranches 6 and 7 of the Energy Supply Improvement Investment Program (US \$55 million and \$80 million, respectively) and tranche 6 of the Afghanistan-Uzbekistan Transmission Line Project were allocated (US \$110 million).

In May 2019, [ADB issued](#) a US \$4 million loan to build and operate a 15.1-megawatt solar power plant. The aim of the project is to reach a goal set by the government to generate 40% share/5,000 MW of the country's total energy capacity from solar by 2032.

Projects planned for 2020-2021 by sector:

Agriculture, natural resources, and rural development: Kabul Managed Aquifer Recharge Project (US \$50 million); Arghandab Integrated Water Resources Development Project (Phase 2) (US \$228.91 million); Horticulture Value Chain Development Sector Project (US \$75 million, additional financing); Climate-Resilient Livestock Value Chain Enhancement Sector Project (US \$75 million);

Energy: Energy Supply Improvement Investment Program-Tranche 8 (US \$120 million); Energy Sector Development Program (US \$50 million); TAPI Gas Pipeline Project (US \$100 million); Road Network Maintenance Rehabilitation Project (US \$160 million); Renewable Energy Development Project (solar and wind energy, US \$70 million).

Source: Afghanistan Country Operations Business Plan for 2019-2021; <https://www.adb.org/documents/afghanistancountry-operations-business-plan-2019-2021>

World Bank Operations in Afghanistan

Since April 2002, the International Development Association (IDA) has committed over US \$4.70 billion for development and emergency reconstruction projects, and six budget support operations in Afghanistan. This support comprises over US \$4.26 billion in grants and US \$436.4 million in no-interest loans known as "credits". The Bank has 11 active IDA-only projects (US \$879 million) and 15 projects jointly funded with the Afghanistan Reconstruction Trust Fund (ARTF), with net commitment value of over US \$1.6 billion from IDA.

Ongoing operations

Agriculture and water management, and land management. National Horticulture and Livestock Project, NHLP (Grant – US \$190 million/Afghan Farmers' Contribution – US \$28.2 million): almost 32.5 thousand ha of new pistachio and fruit orchards were established in 34 provinces; over 32 thousand ha of existing orchards were rehabilitated; more than 143 thousand kitchen gardening schemes were established; and 205 thousand livestock farmers were supported.

Afghanistan On-Farm Water Management Project (ARTF Grant – US \$70 million): by its closure on 31 December 2019, good progress was achieved in the agreed targets and disbursing grant proceeds. The cumulative disbursement rate reached 95%. Over 742 km of canals, serving around 7,700 hectares of land, were rehabilitated, and 621 Irrigation Associations were established. 120 Land Laser Leveling units were distributed by the project to private operators serving about 1,400 ha of land. The project team showcased high efficiency irrigation technologies at 51 demonstration sites and supported 122 Farmer Field Schools, covering over 4,000 farmers. The Farmers' Call Center (FCC) [was established](#) and equipped with computers linked to a database on agricultural issues. The experts field about 250-300 calls a day, covering a wide range of topics – crop disease, irrigation, livestock disease, planting, and fertilizing.

Irrigation Restoration and Development Project (IDA Grant – US \$97.8 million/ARTF Grant – US \$118.4 million/Government of Afghanistan – US \$3.5 million): progress had been made in all areas. In the irrigation component, a total of 200 irrigation schemes have been rehabilitated, covering some 284 thousand ha of irrigation command area and 521.3 thousand farmers. A total of 25.68 km (out of 58.26 km of project target) critical river basin erosion protection has been completed so far in various parts of the country.

In the small dam component, a feasibility study on six dams was developed. Dam Safety Inspection reports were prepared for 10 existing dams in various parts of the country. In the hydromet component, installation of 127 hydrological stations and 56 snow and meteorological stations was completed.

Afghanistan Strategic Grain Reserve Project (IDA Grant – US \$20.3 million/Japan Social Development Fund Grant – US \$9.7 million): the project enabled the Ministry of Agriculture, Irrigation and Livestock to establish a strategic wheat reserve to be available to Afghan households to meet their needs following any unforeseen emergency situation that affects access to wheat for their consumption, and to improve the efficiency of grain storage management. The project supports the establishment of a governmental semi-autonomous corporation to be in charge of managing the grain reserve of the country and coordinate its activities with other governmental agencies and donors.

Afghanistan Land Administration System Project (IDA Grant – US \$25 million/ARTF Grant – US \$10 million): the project's objective is to support the development of the Afghanistan land administration system and provide the population in selected areas with improved land registration services, including issuance of titles and occupancy certificates (OCs).

Energy. CASA-1000 (IDA Grant/Credit – US \$526.5 million): Afghanistan is expected to receive 300 MW of electricity import from Tajikistan and the Kyrgyz Republic through the existing 220 kV AC lines from Sangtuda substation, and Tajikistan to Chimtala substation in Kabul via Pul-e-Khumri. CASA-1000 came into effect in January 2018. Three contracts for the HVDC transmission line in Afghanistan were signed in December 2017. Survey and design works are in the final stages. Construction of the line in Lot 3 started in January 2020, while work in Lot 1 and 2 is expected to begin in March 2020.

The Scaling Solar project⁸² is located in Herat province (40 MW) and, being the largest renewable plant in the country, will have a significant impact on the energy landscape as Afghanistan currently relies on imported electricity.

Naghlu Hydropower Rehabilitation Project (US \$83 million): 50 MW of previously nonopera-

tional capacity of Naghlu Hydropower Plant was revived by rehabilitating Unit 1 and overhauling Unit 3. Unit 2 also requires overhauling. Work on dam safety enhancement is also underway. The contract for procurement of two additional pumps, required to completely drain both galleries, is signed and the pumps are expected to be installed in April 2020. The contract for conducting the Environmental and Social Impact Assessment of Naghlu dam is expected to be signed in March 2020. It is planned to expand the Kajaki Dam and renovate and revive full capacity of Darunta HPP.

WB [approved a financing package](#) of US \$98.8 million consisting of guarantees, a loan, and swaps to support two gas-to-power energy projects in Afghanistan. The projects aim to increase the amount of domestically generated electricity while leveraging private financing for the country's energy sector.

Gender. Women's Economic Empowerment & Rural Development Project (US \$25 million by IDA; US \$75 million by ARTF); Strengthening Women's Economic Empowerment Project (US \$2.7 million by Japan Social Development Fund).

Source: World Bank Group in Afghanistan: Country Update; <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/389621554235509595/the-world-bank-group-in-afghanistan-country-update>

FAO Operations in Afghanistan

The [Country Programming Framework](#) (CPF 2017-2021) sets out 4 strategic pillars of expertise to guide FAO partnership with and support to the Government of Islamic Republic of Afghanistan: (1) Better governance through improved capacity for policy planning, land reform, decentralization, and management of common natural resources; (2) Fostering expansion of irrigation and field water management; (3) Intensive agriculture for surplus commercialization, value chains development, and job creation; (4) Supporting vulnerable farmers for improved food & nutrition security, resilience, and emergency response to natural and man-made disasters and climate change.

The **fourth phase of the FAO's irrigation project** "Enhancing Rural Livelihoods through Improved Irrigation Facilities in Bamyán, Kabul and Kapisa Provinces" started (with a total cost of US

⁸² Expanded private investments in solar photovoltaic systems projects

\$9.9 million). The project aims to rehabilitate about 28 irrigation systems with nearly 191 km canal length covering 7,000 hectares of land, which will directly benefit over 16,000 farming families through increased agricultural production and productivity. It is expected to increase the wheat yield by 25% from the current value.

Upon the request from the Ministry of Agriculture, Irrigation and Livestock (MAIL) through South-South Cooperation Framework, experts from Thailand **conducted an extensive needs assessment** of the newly established animal feed quality control laboratory of MAIL in Kabul. The scope of the two-week mission was to take stock of the existing laboratory equipment, assess the capacity of the Afghan laboratory technicians and conduct required technical training to these laboratory staff.

About 75% of Afghan households depend on crop and livestock production for their income, and access to quality feed determines animal productivity, health and welfare. In 2018-2019, **FAO supported** thousands of drought-affected families across the country with quality livestock feed.

FAO and GCF have joined forces to **implement the first-ever** GCF project in Afghanistan that focuses on building the capacity of Afghanistan's National Environmental Protection Agency (NEPA). The project is funded by GCF that provides US \$300 thousand for its implementation.

Planned projects. Integrated Emergency Agriculture and Livelihood Assistance to Food Insecure Farming Families (2020-2021; US \$2.9 million); Emergency Agricultural-Livelihoods Safeguarding and Rebuilding Livelihoods and Eroded Coping Capacity (2020; US \$2.2 million).

Source: www.fao.org/countryprofiles/index/en/?iso3=AFG

USAID Operations in Afghanistan

Agriculture and water management. In 2019, a number of projects was continued, including on support to value chains in crop and livestock production, active promotion of innovations in agriculture, research and innovations in grain crops, etc. The following projects were completed: Commercial Horticulture and Agricultural Marketing Program (CHAMP) (February 2010 – December 2019, US \$71 million); On-Farm Water Management Project (OFWMP), Second Phase (January 2016 – Dec 2019; USAID contributed US \$24.2 million of the total US \$45 million).

Source: <https://www.usaid.gov/afghanistan/agriculture>

USAID supports agricultural education and collaborates with several universities in Afghanistan. It hosted the National Agriculture Education, Research, Extension and Economic Conference (July 15-17, 2019), which endorsed the establishment of a National Agriculture Research and Education Council (NAREC), a platform for policy dialogue and technical cooperation between Afghan ministries and agencies, and development partners.

Source: <https://wadsam.com/afghan-businessnews/usaidsupports-narec-forum-to-resolve-ruralissues-in-afghanistan/>

Economic growth. The following projects were continued: Women in the Economy (July 2015 - June 2020, US \$71.5 million); Afghanistan Investment Climate Reform Program (March 2015 - March 2022, US \$13 million); Multi-Dimensional Economic Legal Reform Assistance Program (February 2018 - February 2023, US \$20 million).

Source: www.usaid.gov/afghanistan/economicgrowth

Energy development. Afghanistan's national utility company Da Afghanistan Breshna Sherkat (DABS) announced that a wind power project will be launched in Herat province. Costing US \$43 million, the project will produce 25 MW of electricity.

Source: <https://wadsam.com/afghan-businessnews/afghanistan-increases-use-of-renewableenergy-sources/>

Infrastructure. North-South Power Transmission Enhancement (2014-2021): USAID provided US \$104 million of this US \$216 million infrastructure project to supply electricity to one million people in 15 previously unserved areas in rural and urban Afghanistan. Construction of the transmission line and substations will accommodate both domestically produced power and imports from Afghanistan's northern neighbors.

Energy Supply Investment Program (2016-2020): USAID provided US \$40 million of this US \$75 million project to build a transmission line and substation from Doshi to Bamyan that will provide low-cost power to Bamyan and other provinces in central Afghanistan.

Kabul Managed Aquifer Recharge (2015-2020): USAID provided US \$7 million to ADB to pilot-test managed aquifer recharge and aquifer storage and recovery technologies as one solution to addressing the rapidly diminishing domestic water supply for Kabul City.

U.S. Geological Survey (USGS) Water Supply Data Monitoring and Analysis (January 2018 - December 2022, US \$1 million). USGS, through support from USAID, is building the capacity of the Ministry of Energy and Water (MEW) to improve management of the Kabul River Basin through increasing water-data availability and analysis.

Source:
<https://www.usaid.gov/afghanistan/infrastructure>

Women empowerment and gender. Work was continued on gender based violence treatment and countering trafficking in persons.

Source:
<https://www.usaid.gov/afghanistan/genderparticipation-training>

China

The early March saw China's **"Two Sessions"** of the National Committee of the Chinese People's Political Consultative Conference and the National People's Congress. In 2018, China achieved a growth rate of 6.6% (the slowest year of growth since 1990). President Xi has again stressed how important it is to stick to the construction of an eco-civilization and the prioritization of ecology. Pollution control, as one of the three tough battles (the other two are preventing financial risks and reducing poverty) for the Chinese government, was further continued in 2019, with focus on war on water, air, and soil pollution. The Yangtze River Economic Belt (YREB) will still be the focus of the construction of eco-civilization, with the help from the legislation of the Yangtze River Protection Law. In this context, the [Action Plan for the Uphill Battle for the Conservation and Restoration of the Yangtze River](#) was issued. It proposes that over 90% of the dark and odorous water bodies will have been under control in the built areas of the cities at or above prefectural level in the Yangtze Economic Belt. YREB encompasses 9 provinces and 2 municipalities, involving 1/5 of China's total land area and supporting 600 million people with almost 40% of China's GDP.

Source:
www.chinawaterrisk.org/resources/analysisreviews/two-sessions-reform-transform/

The Ministry of Ecology and Environment (MEE) released the **2018 State of Ecology and Environment Report** (SOEE) (May 29). This is the first SOEE report that looks at China's environmental status since the implementation of the [Water Pollution Prevention and Control Law](#) and the announcement of the MEE reform in March 2019.

Some key points of the report are:

- Central government upped funding of environmental protection and pollution control to ¥255.5 billion, which is 5x compared to the ¥49.7 billion in 2017;
- China has delineated ecological protection "red lines" for 15 provinces/municipalities;
- the rectification rate of problems in 1,586 water resource bodies has reached 99.9%;
- 1,009 out of 1,062 black and smelly water bodies in 36 major cities have been fixed; and
- 8% of provincial-level (or larger) industrial parks have built centralized wastewater treatment facilities and automatic monitoring devices.

As for water quality, the report shows some significant improvement in several water-related aspects but also emphasized that much efforts still needed to win the "war on pollution": groundwater worsened drastically: both groundwater and shallow groundwater quality have dropped significantly: with the proportion of groundwater stations with "good" and "excellent" quality plunging almost 3x compared to last year; whereas the proportion of shallow groundwater stations with "very bad" quality surged >3x. This may be rather reflecting the true state of groundwater as monitoring stations have up 2x from 5,100 to 10,168 stations. Last year, the monitoring of groundwater functions was dispersed across various ministries, but now under the ministry reform, MEE is fully in charge of monitoring the nation's ecological environment and responsible for supervising and preventing groundwater pollution. At the same time national surface water quality continues to improve across all Grades⁸³. Water quality of key lakes & reservoirs has finally improved since its decline in 2015. The share of key lakes & reservoirs with Grade I-III improved from 63% in 2017 to 67% in 2018. The proportion of water bodies that are "unfit for human contact" (Grade IV-V+) also improved from 11% to 8%. The overall quality of China's Main River Basins has gradually improved from 2016 to 2018. Grade I-III water improved from 71.8% to 74.3%; Grade IV-V slightly improved from 19.8% to 18.9%; and Grade V+ improved from 8.4% to 6.9%. Southern rivers (Yangtze and Pearl) are doing relatively well and 5 Northern rivers (Yellow, Songhua, Huai, Hai, and Liao) continue to struggle in reaching the Water Ten target of 70% surface water

⁸³ In China, water quality is classified into Grades: from I to VI, with VI meaning the strongest pollution

meeting Grade III or better by 2020. Most likely the Yellow River will be the first to meet the target. By 2020, the Grade V+ surface water quality of the main river basins must also be controlled fewer than 5%. At present, only Yangtze and Huai Rivers have met this target (Pearl almost meets the target, currently at 5.5%). Yangtze is the only river that meets both “70% (Grade I-III)” and “<5% (Grade V+)” targets.

Source:

www.chinawaterrisk.org/resources/analysisreviews/2018-state-of-ecology-environment-reportreview/

The National Development and Reform Commission and the Ministry of Water Resources presented **an action plan to tighten water consumption** (15 April) to improve efficiency in the use of natural resources and better protect the environment while boosting economic growth. China has water shortage. Each year, the country faces shortfall of 50 billion m³ of fresh water. China's water resource per capita is only one-third of the world's average. Regional disparity has made it worse. Southwestern and southern parts of the country have rich water resources while one-fourth of provincial regions are facing severe lack of water. In industrial and agricultural production, more technologies can help save such resource. It also applies to China's urbanization process, as now only 11% of towns can process waste water. China lags behind leading economies in water-use efficiency. Every ¥10 thousand in industrial added value consumes 45.6 m³ of water, double that for developed economies. Water conservation should be promoted from developing, using and protecting the natural resource with careful allocation, said E Jingping, minister of water resources. Projects that do not pass water conservation assessments will not be approved. Universities will join efforts to save water under a new evaluation system. By 2020, water consumption per ¥10 thousand (US \$1,487) of GDP is expected to drop by 23% from that in 2015, with a 20-percent reduction in using water to produce ¥10 thousand in industrial added value, according to the plan. In addition, China's overall water consumption will be constrained within 670 billion m³ by 2022, with improved conservation. Furthermore, the figure will be controlled within 700 billion m³ with water conservation and recycling at a world-leading level by 2035. The plan sets six key tasks, including control of overall water consumption, reducing agricultural, industrial and urban use and technological innovation. In the meantime, two measures will deepen reform in establishing the water price and cultivate a competitive service market. The plan encourages private capital to join and expand financing channels.

Source: http://www.china.org.cn/china/2019-04/25/content_74720155.htm

China spent a record ¥726 billion (US \$104.46 billion) **on water conservation projects** in 2019, said a senior official with the Ministry of Water Resources. The country started the construction of 23 key water conservation projects and completed over 90% of the annual investment plan. China further improved drinking water quality in rural areas, which benefited 54.8 million people. The country also addressed the problem of excessive fluoride in drinking water for 6.15 million rural people. China will step up efforts to improve water conservation infrastructure such as farmland irrigation facilities in poverty-stricken areas in 2020, and push for the construction of key water conservation projects.

Source: http://www.xinhuanet.com/english/2020-01/09/c_138691595.htm

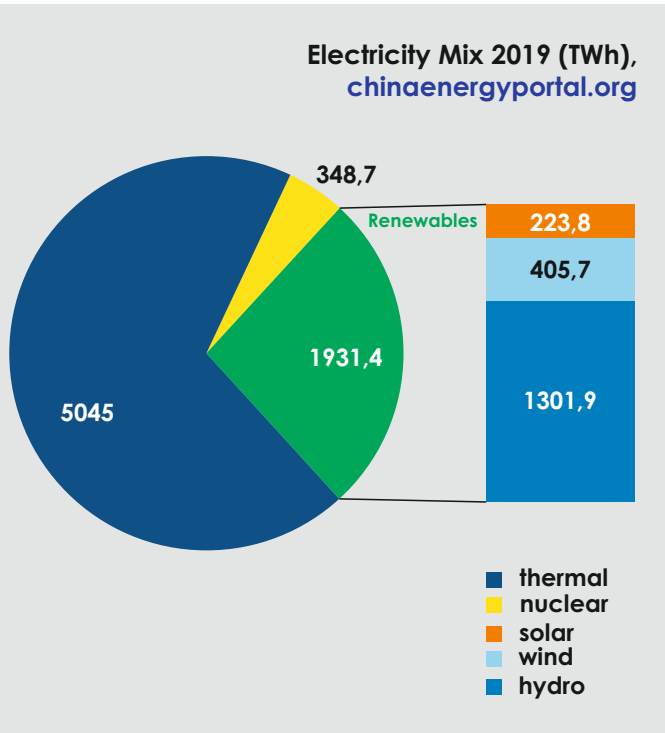
China's Artificial Forest Area Ranks First in the World. According to the NASA study (2019), China accounts for ¼ of the new plantation area from 2000 to 2017. Official data from the National Forestry and Grassland Administration shows that in the past two decades China has achieved double increase in forest area and forest stock volume. China also become the world's largest wood place. According to the 8th National Forest Inventory of China (2009-2013), the area of forest in China reached 208 million ha with the forest coverage of 21.63% and forest volume of 15.137 billion m³. Because of major environmental restoration projects, such as dust source area control around Beijing and Tianjin and rocky desertification comprehensive management project, now the area of desertification in China changed from the situation of annual average expansion of 3,436 km² in the 1990s to the annual average reduction of 1,980 km². There is a historic transition from “desert invasion” to “forest invasion”.

Source: <http://en.people.cn/n3/2019/0226/c90000-9549924.html>

Hydropower remains the main source of energy in China's national RES system, followed by wind and solar power. According to China Energy Portal, in 2019 the share of renewable energy (including HPPs) in electricity production reached 26.4%. Hydropower generation increased by 5.7%, but mainly due to higher water content, as capacity growth was only 1.1% (4 GW). The rate of wind energy commissioning increased by 20%, demonstrating a revival after subsidies were terminated. Solar capacity growth slowed down, accounting for 15% of electricity generation growth (with only 26% increase in solar power generation). This in 2018 was caused by the decision of the Chinese Government to change the policy in the field of solar energy;

in 2019 it was aggravated by the delay in outlining the new rules for the sector, which was not made public until June.

Source: <https://chinaenergyportal.org/en/2019-electricity-other-energy-statistics-preliminary/>



In 2019, the construction of the Wudongde Hydropower Station, China's fourth-largest and the world's seventh-largest hydropower project, was continued. Spanning across the Jinsha River, the upper stretches of the Yangtze River in southwest China, Wudongde hydropower station has a maximum dam height of 270 meters and a total reservoir capacity of 7.4 billion m³. The hydropower station will be equipped with 12 hydro-generator units, each having a capacity of 850,000 kW. The total installed capacity of the station will be 10.2 million kW and the annual power generation is estimated at 38.91 billion kWh. The station is scheduled to start storing water in July 2020. The first generator will be put into use in August 2020, and all units will be operational by December 2021.

Source: http://www.xinhuanet.com/english/2019-06/18/c_138153092.htm

The world's tallest dam is to be built in Xinjiang. China Gezhouba Group Co. Ltd. (CGGC) has signed an agreement to undertake the construction of a water control project at the upper reaches of the Aksu River in northwest China's Xinjiang Uygur Autonomous Region. CGGC inked a public-private partnership agreement worth ¥8.99 billion (about US \$1.26 billion) with local authorities for the Dashixia Water Control

Project, which requires a dam as high as 247 meters to tame the Aksu River. The damming of the Aksu River would need a wall height equivalent to an 80-floor building, which would create a reservoir with a storage capacity of 1.17 billion m³. It will be installed with a hydropower capacity of 750,000 kW and the ability to generate 1.89 billion kWh of electricity a year. The multi-functional water control project is expected to take eight and half years.

Source: http://www.xinhuanet.com/english/2019-09/24/c_138419098.htm

China Three Gorges rules out new domestic hydro projects. In January, China Three Gorges Corp (CTGC), operator of the world's largest hydropower plant, announced that it is turning to projects offshore as domestic costs soar and space runs out on the country's crowded rivers. The company's vice-president informed that CTGC doesn't have any plans to build more hydropower projects in China but will develop more projects overseas, mostly in South Asia, Southeast Asia, Africa and Latin America.

Source: www.reuters.com/article/china-hydropower-threegorges-idUSL3N1Z91QN

In November 2019, the National Energy Administration of the People's Republic of China put up for discussion "Recommendations for promoting sustainable and healthy development of small hydropower". This document, aimed at restricting the development of small hydropower and streamlining the procedures for impact assessment and plant shutdown, is evidence of the tremendous progress in the environmental risk management system in China. The development of the document was preceded by a two-three-year summer campaign to "clean up rivers from harmful small hydropower", during which hundreds of HPPs were closed and demolished and thousands of HPPs were issued instructions to reduce the impact on river ecosystems and comply with environmental releases standards. Only in one Hubei province, according to its Water Management Service, 190 stations were liquidated, and 1,530 hydroelectric power plants received instructions. Many observers pointed out that this campaign is carried out without a clear plan and a real assessment of its environmental benefits.

Source (in Chinese): www.chinapower.com.cn/focus/20191114/129028.html

In 2019, China experienced several weather disasters, including five powerful typhoons. According to the National Bureau of Statistics of

China, natural disasters incurred ¥258.5 billion (US \$38 billion) losses in 2019. Water-related disasters hit the national economy most: floods caused a direct economic loss of ¥192 billion, oceanic disasters – ¥11.7 billion. The middle and lower reaches of China's Yangtze River suffered from the most severe drought in 40 years, with temperatures up to 3°C higher than normal in some regions in 2018. The total arable land affected by drought in the Yangtze's middle and lower reaches was 154% higher than in 2018. The drought was affecting local grain production, and had delayed rapeseed planting in the region. Government forecasters have attributed record high summer temperatures and rainfall throughout China to global warming.

Sources:

http://www.stats.gov.cn/english/PressRelease/202002/t20200228_1728917.html;
https://www.reuters.com/article/us-china-drought/chinas-yangtze-region-facing-severe-drought-affecting-production-report-idUSKBN1XG35I?mc_cid=200bb72f4f&mc_eid=db7dc5ba26

Other Asian Countries

Earlier in November, Malaysia renewed calls for Singapore to cooperate in revising a 1962 water supply agreement. According to Malaysia's Natural Resources Minister, Xavier Jayakumar, the water reserve margin in the state of Johor has fallen to 4% and may reach zero by 2020. The recommended margin is 10%. Under the 1962 Water Agreement, Singapore may extract 250 million gallons (946 million liters) a day from the Johor River. Singapore pays US \$0.01 for every thousand gallons (3,785 liters) of raw water and sells treated water back to Malaysia at US \$0.18 per thousand gallons. The agreement expires in 2061. Malaysia claims that the deal would need to be renegotiated. Singapore, meanwhile, contends that Malaysia lost the right to re-negotiate the price of water under the terms of the Agreement when it failed to do so in 1987. It claims that it effectively subsidizes the cost of treating the water it sells back to Malaysia. For Malaysia, there are several reasons for its position on the Water Agreement. The country's level of debt became more manageable in 2019, but remains high. The Malaysian Government hopes to boost revenue by renegotiating the terms of the Agreement and increasing the price of water sold to Singapore. Singapore, meanwhile, views the water dispute as an existential issue. The Water Agreement was formalized in the 1965 Separation Agreement, and Singapore views any breach of this agreement as a threat to its sovereignty. Furthermore, Singapore is highly reliant on Malaysia

for its water, receiving nearly half of its water supplies from its neighbor. Singapore has tried to diversify its water sources, by increasing the quantities of rainfall caught in reservoirs, recycling water and desalination. Nevertheless, its reliance on Malaysia and the impacts of climate change have put Singapore among the countries most likely to be water-stressed by 2040. Malaysia and Singapore have extensive and complex levels of economic interdependence. Both countries count the other as one of their largest trading partners and movement of people between the two countries is high. Singapore is also the second-largest contributor of foreign direct investment to Malaysia. Considering the interdependence between Singapore and Malaysia, it is unlikely that tensions over the Water Agreement will escalate much further than harsh words. As both countries seek to placate domestic interests, however, those tensions are likely to continue to strain their relationship.

Source: www.waterpolitics.com/2019/11/20/water-disputebetween-malaysia-and-singapore/

In 2019, India has experienced increasingly extreme weather conditions leading to severe droughts and floods. A debilitating heat wave in the summer coupled with a delay in the monsoon led to drought-like conditions in several parts of the country. An [analysis of the water levels](#) in 91 reservoirs across India as of June 15 showed that in 85 of them, the water level is [below 40%](#) of the capacity and in 65 it is below 20%. Then India received the [heaviest monsoon rainfall in 25 years](#). The monsoon normally begins in June and ends by September, but its delayed retreat in 2019 has sparked floods that [displaced or injured](#) at least 2.5 million people in 22 states and killed several thousand. Thanks to high water conditions the [Sardar Sarovar Dam](#) has achieved its full reservoir level of 138.68 metres for the first time since its height was raised in 2017. It is important to note that while many portions of India have received a lot of rain, some regions have actually [experienced a rainfall deficit](#). Water crises are unfolding all across India, a product of population growth, modernization, climate change, mismanagement and the breakdown of traditional systems of distributing resources. Nearly all of India's biggest cities, including New Delhi, the nation's capital, are rapidly [depleting their groundwater reserves](#), and 40% of India's people could lack drinking water by the end of the next decade. In the southern city of Chennai, India's fifth largest city, with a population of about 10 million people, drinking water reserves almost completely dried up in 2019. In the agricultural heartland of India's northern plains, farmers generally pay little or no-

thing for the groundwater they use or the energy needed to pump as much as they desire. That has led them to plant water-intensive crops, creating shortages, especially during lapses in the annual monsoons that endanger the country's food supply. Various Indian states are locked in legal and political battles with one another over the control and use of water. Beset by the multitude of water problems, Prime Minister Narendra Modi began his second term recently by appointing a ministry of water, combining previous ministries that oversaw wetlands and riverways development and drinking water and sanitation. The Prime Minister also launched a [plan \(US \\$842 million\) to tackle water shortages](#) in the country's seven heartland states. The plan would help replenish groundwater (60% of the irrigation for agriculture comes from groundwater) and boost overall availability in Rajasthan, Karnataka, Haryana, Punjab, Uttar Pradesh, Madhya Pradesh, Maharashtra and Gujarat states, which produce staples such as rice, wheat, sugar and oilseeds. Modi also exhorted farmers to increasingly adopt drip and sprinkler irrigation and use water-management techniques as well as eschewing water-guzzling crops.

In March 2019, India Cabinet approved measures to promote hydropower sector. These include declaring large hydropower projects as renewable energy source and part of non-solar renewable purchase obligation as well as providing budgetary support for flood moderation cost and enabling infrastructure cost and tariff rationalization measures to reduce tariff and thus the burden on the consumer. India is endowed with large hydropower potential of 1,045,320 MW of which only about 45,400 MW has been utilized so far. Only about 10,000 MW of hydropower has been added in the last 10 years. The hydropower sector is currently going through a challenging phase and the share of hydropower in the total capacity has declined from 50.36% in the 1960s to around 13% in 2018-19.

Source: <http://pib.nic.in/PressReleaselframePage.aspx?PRID=1567817>

111 National Inland Waterways have been declared on rivers, canals, creeks, estuaries in 24 states and 2 Union Territory of India with the implementation of National Waterways Act, 2016. National waterways have been proposed with the claim that inland water transport is a cost-effective, environmental friendly and safe mode for the transport of bulk and hazardous goods. To make people more informed on various environmental and social impacts of the development and operationalization of waterways on the Indian rivers, Manthan Research and Social Development Society started from 2019 providing

monthly updates on National Inland Waterways of India.

Source: www.manthan-india.org/monthly-updates-on-national-inland-waterways-of-indiaupdate-15-developments-in-november-2019/

Prime Minister and Chief Justice of Pakistan Fund for Diامر Bhasha and Mohmand Dam raised Rs12 billion (US \$75 million) by the end of 2019. The Chief Justice of Supreme Court established a Supreme Court of Pakistan Diامر Bhasha and Mohmand [Dams Fund](#) to raise funds for the construction of these dams (10 July 2018). The Court supervises the Fund and its Registrar operates its account directly. Later, the Prime Minister of Pakistan announced to join efforts with the Chief Justice of Pakistan for this cause. The fund was renamed accordingly. [Some analysts](#) criticised the establishment of the dam fund because it fell outside the normal boundaries of jurisprudence, and contributions are not always voluntary (the salaries of government servants and army personnel were subjected to deductions for the dam fund), and in some instances, the donations were linked to the outcome of legal proceedings.

Sources: www.supremecourt.gov.pk/dam-fund-statistics/, www.dawn.com/news/1458849/end-the-dam-fund, www.lowyinstitute.org/the-interpretor/pakistan-wrongheaded-crowdfund-mega-dams

Mongolia and Russia signed Agreement for Cooperation in Electricity Power, which makes new dams along the Selenge River basin in Mongolia unnecessary, may enable faster deployment of renewable energy and includes environmental safeguards and basis for equitable energy trade. Rivers without Boundaries Coalition has been promoting such solutions for 6 years.

Source: www.transrivers.org/2019/2922/

World Bank Mining Infrastructure Investment (MINIS) project in Mongolia has closed and two dam planning objectives have been officially removed from it in fall 2019. Consequently the Regional environmental assessment of hydro-power options is put on hold indefinitely.

Source: www.worldbank.org/en/country/mongolia/brief/mongolia-mining-infrastructure-investment-support-project

Large River Basins in South Asia

Indus River Basin

In 2019, the International Centre for Integrated Mountain Development (ICIMOD) released the first comprehensive report on the Hindu Kush Hi-

malayan (HKH) region, and it contains some very worrying news for the Indus basin. The report looked at 16 components of change in the HKH region, filling in a gap left by Intergovernmental Panel on Climate Change (IPCC) reports that had limited information from the region. One of the areas of key concern was the cryosphere, or ice coverage, in the area, which is home to the most glaciers after the Polar Regions. According to the report, 36% of the volume of these glaciers will be gone by 2100 if the world manages to keep warming below 1.5 °C. If this temperature increase hits 2 °C, 49% of the volume of these glaciers will be gone. The retreat of these glaciers will have an immediate impact on the 240 million people that live in the mountains. Given that poverty rates in these regions is 33%, significantly higher than the overall 25% for the eight countries that border the region, this will be a disaster in itself. The more complex, and problematic, issues will be downstream to these regions, inhabited by 1.65 billion people, and one of the basins most impacted will be the Indus – that straddles India, Pakistan and Afghanistan. One of the reasons is that the Indus River is the one most dependent on snowmelt and glacier melt contributing close to 80% of its water flow. As the glaciers retreat at a sharper pace, this basin will have more water flowing in, but in an increasingly unpredictable manner. The Indus region is one of the areas of most concern for rainfall reasons. Although the science on the western disturbance, which affects the South Asian monsoon, remains unclear, it is already evident that rainfall patterns have become more uneven, with an increase in extreme weather events.

The Indus basin is already one of the worst affected by extreme weather events in the HKH region, with the most people killed from 1980 to 2015. It is also one of the areas where a number of hydropower projects and large dams are either planned, or being built, including key hydropower projects in Pakistan supported by China under the China-Pakistan Economic Corridor project. Sustained, and even increased, water flow in the rivers until at least 2050 will mean that there will be little rationale to reassess these dam projects if they are based only on narrow economic rationale. The variation of water flows, in fact, will boost those arguing that large storage projects are needed to stabilize water availability over the year. Unfortunately the history of hydropower projects in South Asia – and elsewhere – has been marked by a lack of regard for environmental safeguards. Moreover, in India alone, indigenous communities, accounting for only 8% of the population, have been 40% of those displaced by large dams.

Compounding the problem for the Indus basin is the conflictual relationship between the four countries that share it: China, India, Pakistan and Afghanistan. Given the stark threat to the whole basin, and the people that live within it, development plans for the region would ideally incorporate findings for the whole area, as well as coordinating disaster management plans. While people have called for the expansion of the Indus Waters Treaty to deal with these issues, with the treaty itself under strain, there seems to be little scope for such an understanding to develop. Unfortunately one of the other issues that the report makes clear is that geographically precise information from mountainous regions remains sparse. This is because the decisions for mountain areas are still largely made by policymakers in the plains. Until and unless that changes, the Indus will continue to be a river of disasters.

Source:

www.waterpolitics.com/2019/02/05/theindus-a-river-of-growing-disasters/

In early 2019, India and Pakistan rekindled the cooperative spirit of a river-sharing treaty that is nearly six decades old. A three-member team of Pakistani experts visited India to inspect hydropower projects under the Indus Water Treaty. They called the visit very successful and invited the Indian experts to visit Pakistan's dam on the Indus River.

Source: www.circleofblue.org/2019/world/whatsup-with-water-brazils-water-after-rupture-of-miningwaste-dam-andmore/?mccid=be7d881c5a&mceid=db7dc5ba26

Ganges River Basin

A trilateral agreement to export hydropower from Nepal to Bangladesh via India. In December, the Bangladeshi government and Indian Company GMR, developer of the 900-megawatt Upper Karnali Hydro Electric Project (UKHEP) in the western Nepal, have finalised the power purchase agreement rate to purchase 500 MW of energy from Nepal. As per the [decision](#) of the Cabinet Committee on Public Purchase, Bangladesh will import the electricity through Indian firm GMR at a tariff rate of US \$7.72 cents per unit for a period of 25 years. UKHEP will be the first private Nepal-based company to export hydropower to Bangladesh via India as per a trilateral agreement. Meanwhile environmentalists oppose the construction of the UKHEP on the main stem of the Karnali, the only major river from the Nepal Himalaya that remains free flowing. They call for the develop-

ment of sustainable hydropower in far-western Nepal, including the Karnali Basin, but NOT on the main stem of the river, given that there are multiple sites on tributaries in the Basin where hydropower can be developed both to meet local needs and for export (see "[2019 Karnali Declaration](#)").

Sources:

<https://thehimalayantimes.com/business/upper-karnali-power-purchase-pact-final/>,
www.transrivers.org/2019/2915/

In 2019, Nepal and India inaugurated the construction work on new Gandak Waterways. Development of National Waterway-37 (Gandak River) from its confluence with river Ganga at Hajipur to Triveni Ghat (Bhaisalotan Barrage, Valmikinagar) will be the first of its kind to link Nepal to Bay of Bengal through Ganga water ways. This project is a part of India's the 2016 National Waterways Act, which raises [concerns](#) in India that the interventions for the conversion of rivers into waterways will need huge financial resources, and have the potential of threatening the existing nature and morphology of these rivers, with large impacts on ecology and local communities.

Mekong River Basin

The Mekong is reeling from the combined onslaught of climate change, sand-mining, and incessant damming of the river, which combined can cause the worst drought recorded in over 100 years in July.

The Mekong originates in the Tibetan Plateau and flows through six countries, including China, Thailand, Laos and Vietnam. During the drought in China and Laos, the upstream hydroelectric dams put even more pressure on the river, holding water. In October 2019, Laos unveiled a new dam in the country's north. The [1.3-gigawatt Xayaburi dam](#) sits on the Mekong River. Laos plans to build nearly a hundred like it by 2020 – many with direct funding and support from China – in a bid to become "the battery of Asia," exporting two-thirds of the energy it will generate from hydropower. Despite the arrival of the rains, according to experts, significant damage has already been caused. Fish stocks have shrunk, given that there once have been the largest freshwater fisheries in the world with \$11 billion in wild-capture fish, excluding fish farms. The water level in the Tonle Sap was reduced to unprecedented shallow areas with one floating village almost completely dried up. Many fish died because of the shallow water, hot temperature, and toxic water resulting from

lack of oxygen. The conclusions of the Mekong River Commission, which is composed of Laos, Cambodia, Thailand, and Vietnam, among many alarming conclusions, found that there would be a 35-40% reduction in fish biomass by 2020; moreover, hydropower development through 2040 will eliminate migratory fish. Mekong provides food security through fishing and wet rice growing for about 60 million people living in the lower Mekong basin in Cambodia and Vietnam. Although the season of monsoons in this region lasts from late August to October, experts are not sure that a rise in water level (even if the rains can fill the river) will help quickly restore the volume of fish resources. Environmentalists hope that the Mekong can still be saved by abandoning some dams and focusing on alternative energy. However, for this to happen, the states through which the Mekong flows must agree among themselves and solve the problem by common forces. However, so far each country is trying to solve its own problems without thinking about the future of the great river. For example, it was [suggested](#) that moving from hydro to solar could protect the Tonle Sap Lake, the world's largest freshwater fishery. Basin-wide water-energy planning and a deeper incorporation of non-hydropower renewable energy sources into Cambodia's future power mix can avoid upstream fragmentation of Tonle Sap and Mekong Basin connectivity and preserve the annual monsoon pulse, which underpins the unique conditions that make the Tonle Sap the world's largest freshwater fishery.

Sources:

<https://thediplomat.com/2019/08/something-is-very-wrong-on-the-mekong-river/>;
www.chinadialogue.net/article/show/single/en/11126-Sustaining-the-heartbeat-of-the-Mekong-Basin

Indonesia: project threatening Tapanuli orangutan suspended by global protests. The Hydroelectric Dam Project in Batang Toru of Indonesia is under construction power plant project funded by the Bank of China and built by Sino-hydro, as part of China's BRI Initiative. Environmentalists expressed concerns over its variety of negative environmental and social impacts, including dooming a newly discovered orangutan species to extinction and asked the Bank of China reconsider the project. The Bank promises to evaluate the project very carefully and make prudent decisions by duly considering the promotion of green finance, the fulfilment of social responsibility as well as the adherence to commercial principles.

Source: www.transrivers.org/2019/2576/

Tampur Hydro Dam: Indonesian court cancels dam project in last stronghold of tigers, rhinos. A court in Indonesia's Aceh province has ordered an end to a planned hydroelectric project in Sumatra's unique Leuser Ecosystem. Environmental groups filed a lawsuit against the Aceh government and the dam's developer earlier 2019 over potential environmental destruction and violation of zoning laws. The area is the last pla-

ce on Earth that's home to wild tigers, rhinos, orangutans and elephants – all critically endangered species whose habitat would be flooded and fragmented by the dam and its roads and power lines.

Source:

<https://news.mongabay.com/2019/09/indonesian-court-cancels-dam-project-in-last-stronghold-of-tigers-rhinos/>

11.3. America

In 2019, within the framework of the Columbia River Treaty between US and Canada **negotiations regarding a modernized treaty**, which started in 2018, **were continued**. Particularly, meetings were held on 27-28 February in Washington D.C. (USA), 10-11 April in Victoria B.C., capital of British Columbia (Canada), 19-20 June in Washington D.C., and 10-11 September in Cranbrook (Canada). The ninth round of talks was scheduled for November in US but was postponed until early 2020. Negotiators discussed ecosystem cooperation, flood-risk management and hydropower coordination, as well as adaptive management. The negotiators have agreed to conduct technical work between negotiating rounds, to support the progress of discussions. Negotiations in June were the first meeting where Canadian Columbia Basin Indigenous Nations participated as official observers, following Foreign Affairs Canada's historic announcement that representatives of the Ktunaxa, Okanagan and Secwepemc Nations will now participate as observers at the Canada-U.S. Columbia River Treaty negotiations. The Columbia River Treaty is seen around the world as a model of transboundary cooperation. Flood risk and hydropower management under the 1964 Treaty benefited millions of people on both sides of the U.S.-Canada border. The Treaty also maintains river ecosystem.

Source:

<https://engage.gov.bc.ca/columbiarivertreaty/>

Drought control in the Colorado River basin (US-Mexico). On 20 May 2019, the Department of the Interior, Bureau of Reclamation and representatives from all seven Colorado River Basin states signed completed drought contingency plans for the Upper and Lower Colorado River basins. These completed plans are designed to reduce risks from ongoing drought and protect the single most important water resource in the western United States. The Colorado River, with its system of reservoirs and water conveyance infrastructure, supplies water for more than 40

million people and nearly 5.5 million acres of farmland across the western United States and Mexico. The reservoirs along the river have performed well-ensuring reliable and consistent water deliveries through even the driest years. But, after 20 years of drought, those reservoirs are showing increasing strain; Lake Powell and Lake Mead, the two largest reservoirs on the system and in the United States, are only 39% and 41% full, respectively. And, while the basin experienced above-average snowpack in 2019, the total system storage across the basin began the water year at just 47% full. In addition to the voluntary reductions and other measures to which the basin states agreed, Mexico has also agreed to participate in additional measures to protect the Colorado River Basin. Under a 2017 agreement, Minute 323 to the 1944 U.S. – Mexico Water Treaty, Mexico agreed to implement a Binational Water Scarcity Contingency Plan but only after the United States adopted the Drought Contingency Plan.

Source:

<https://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=66103>

In the United States, Central and Middle America was overwhelmed by floods in spring and summer 2019. Months of above-average rainfall have made rivers too deep and fast-moving to safely navigate, severely restricting normal shipping activities. The Arkansas River has been closed to traffic. So has the Illinois River, a critical conduit to Chicago and the Great Lakes. The New York Times reported that even if the rivers reopen, the impact on the economy could last. The disruption to supply chains, inventories and transportation could mean higher prices and limited supplies for consumers this summer and fall.

Source:

<https://www.circleofblue.org/2019/world/whats-up-with-water-global-rundown-06-17-18/?mccid=305c1edf1c&mceid=db7dc5ba26>

The Michigan Department of the Attorney General unexpectedly **dismissed criminal charges** in eight cases **linked to the Flint water crisis**. Many Flint residents, feeling betrayed by a system that supplied them with lead-tainted water, were stunned and dismayed by the development. Prosecutors for the new administration dropped all remaining charges against officials who were accused of mismanaging the city's water and mishandling the crisis that followed. The Flint Water Prosecution team says a more thorough investigation will now be conducted, adding "all available evidence was not pursued" by the previous team of prosecutors. Dana Nessel, Michigan's attorney general, supported the decision to drop the charges. But she said, "I want to remind the people of Flint that justice delayed is not always justice denied."

Source:

<https://www.circleofblue.org/2019/world/whats-up-with-water-global-rundown-06-17-18/?mccid=305c1edf1c&mceid=db7dc5ba26>

In 2019, U.S. annual wind generation exceeded hydroelectric generation for the first time. Wind is now the top renewable source of electricity generation in the country.

Source:

<https://www.eia.gov/todayinenergy/detail.php?id=42955>

On 25 January, a dam connected to an iron ore mine, located in a large town in southeastern Brazil, collapsed. More than 200 people died. The dam is owned by Vale, the same company that was involved in the 2015 Mariana dam disaster. Both dams were made of compacted layers of mining waste – this is the cheapest technology. In addition to deaths and destruction, this tragedy significantly worsened the environmental situation in the region. Toxic waste completely destroyed the ecosystem of the Paraopeba River, made water unsuitable for drinking, and killed hundreds of animals. Due to the mud ingress into the river, the level of iron increased a hundred times and aluminum – a thousand times. In addition, mercury, which is not used for iron extraction, was found in water. According to one of the versions, this happened because the disaster affected the former gold deposits. Contamination is observed for 150 km. Iron mining industry waste was also found in the neighboring larger San Francisco River. The tragedy in Brumadinho is called the most terrible environmental disaster in the history of Brazil and the largest in the world due to the collapse of tailings dams. The reasons for the breakthrough are still being clarified. The dam in Brumadinho was inspected a month before the tragedy, and the company was already informed that it was under risk.

Source (in Russian):

<https://lenta.ru/articles/2019/06/26/brazil/>

In the period from late February to early March, two icebergs that cover thousands of square kilometers broke off from Chile's Grey Glacier. The dimension of the first iceberg is 8.8 ha, the size of 12 soccer fields, and detached on 20 February, while the second one, which broke off on 7 March, was of 6 ha. This means that only 15 days have passed from one break to the other. Even if the detachment of ice from glaciers is a natural phenomenon, what alarms experts is the increased frequency of these events. In fact, the latest detachment of ice from Grey Glacier took place in November 2017, and it was an even larger iceberg. But the other significant ruptures date as far back as the early 1990's. Scientists are blaming these ever more frequent events on a changing climate. In fact, after 2018 as the fourth hottest year ever in a row, 2019 has started in the same trajectory, with the austral summer setting new records. Even Patagonia had hot temperatures: for the first time in history the town of Puerto Natales, on the southern tip of the country, exceeded 30°C. According to experts, this abnormal trend has weakened the glacier's walls causing the breaks. The glacier, a 270-square-kilometre giant, has lost two kilometers over just 30 years. These phenomena seem to be part of a downward spiral: rising temperatures and increased rainfalls speed up the melting of ice, which in turn increases the lake's water level and, at the same time, reduces the ability of the glacier to reflect sunrays, thus exacerbating the problem. It's a vicious cycle that not only affects this part of national park but also other Chilean glaciers, which cover more than 20,000 km² of land in the country and 80% of which have retreated in the past decades due to global warming according to the United Nations.

Source: www.lifegate.com/people/news/icebergs-greyclacier-patagonia-chile

The 2019 Amazon rainforest wildfires season saw a year-to-year surge in fires occurring in the Amazon rainforest and Amazon biome within Brazil, Bolivia, Paraguay, and Peru. The main causes of the fires were slash-and-burn approach to deforest land for agriculture and effects of climate change and global warming due to unusually longer dry season and above average temperatures around worldwide throughout 2019. It is estimated that over 906,000 ha of forest within the Amazon biome has been lost to fires in 2019. The fires and the deforestation in the Amazon add another threat to a river system and aquatic ecosystems that are already under major pressure from the building of new dams, mining, and other activities.

Source:

www.nationalgeographic.com/environment/2019/09/amazon-fires-brazil-threaten-fish/

11.4. Australia and Oceania

Based on its new assessments published in January 2019, the South Australian Murray-Darling basin royal commission recommended a complete overhaul of the Murray-Darling Basin Plan, including reallocating more water from irrigation to the environment. The report also found commonwealth officials had committed gross maladministration, negligence and unlawful actions in drawing up the multibillion-dollar deal to save Australia's largest river system. The 746-page report contained 111 findings and 44 recommendations. The South Australian Murray-Darling basin royal commission found the original plan ignored potentially "catastrophic" risks of climate change and called for them to be central to a rewrite of the plan. The Australian Conservation Foundation urged governments to ensure that the plan complied with environmental obligations of national water law and took account of climate change science. The findings of the royal commission fit a consistent pattern of behavior from Australian governments that has resulted in environmental disaster and the catastrophic loss of wildlife. The investigation into the plan, prompted by allegations of water theft by New South Wales cotton farmers, recommended major reform, including resetting water-saving limits, repealing the outcome of the northern basin review, dumping major projects, like the Menindee Lakes project, proposed by NSW, and new measurements for water on floodplains. He also called for the states to review their water resource plans to expressly recognize and authorize the taking and use of water by indigenous people in exercise of native title rights.

Source: <https://www.theguardian.com/australia-news/2019/jan/31/murray-darling-basin-royal-commission-report-finds-gross-maladministration?mccid=2d5c8bc37f&mceid=db7dc5ba26>

The National Water Grid Authority commenced operation on 1 October 2019, delivering on the Government's election commitment of 30 April 2019. The Authority will deliver the Government's commitment to invest US \$100 million into bringing world best science together to identify opportunities to ensure water supply and reliability. The Authority will also deliver the US \$3.5 billion commitment to identify and build new water infrastructure through the US \$1.5 billion the [National Water Infrastructure Development Fund](#) and the US \$2 billion the [National Water Infrastructure Loan Facility](#). In 2019, nearly US \$1.5 billion is already committed from these funds to finance the construction of 21 water infrastructure projects.

Source: www.nationalwatergrid.gov.au/

In 2019, much of the east coast in Australia was gripped by drought that began more than two years ago. The dry conditions are worst in Queensland, the biggest beef-producing state, but extend into much of New South Wales. The situation is much better in Western Australia, where the wheat crop had good late rain and is likely to be on a par with the bumper season last year.

Source: www.aljazeera.com/ajimpact/globalweather-chaos-shrivelling-asias-crop-production190730032441907.html

Bush fires in Australia and their impact on freshwater ecosystems and drinking water. Bush fires have been raging in the southeastern states of New South Wales and Victoria since September 2019. Scale of fires is significantly higher than average during the annual summer drought season in Australia from December to March. More than 38,000 square miles, an area the size of South Carolina, have burned. At least 28 people have died and some 2,000 houses in rural towns have been destroyed. Australian authorities declared a state of emergency. Australia's meteorologists had been predicting a record fire season for months. The weather watchers saw early in the year that Australia faced a fire-raising combination of natural rainfall cycles – notably fluctuations in sea temperatures in the Indian Ocean that brought high temperatures and drought to southeast Australia this year – and a very unnatural trend toward a hotter and drier climate. Australia is among the countries most exposed to the gathering pace of planet-wide warming. In 2019, Australia experienced its highest recorded temperatures, 1.5°C above the late 20th century average, and 2°C above the early 20th century average – twice the global increase. The year also saw the six hottest days ever recorded in Australia, maxing out at 49.9°C. Higher temperatures are ensuring that vegetation dries out faster and further in droughts, creating extreme fire risk. And the droughts have come. Australia's average rainfall in 2019, at 10.9 inches, was 40 percent below the late 20th century average and 12 percent below the previous lowest. The resulting fires far exceeded in extent Australia's most deadly bushfire disaster in February 2009, when 173 people died but only 1,700 square miles burned. Scientists are concerned of potentially [dire impacts on waterways from the bushfire crisis](#). The aftermath of the fires could bring devastation to freshwater animals and plants, as well as drinking water catchments. This is because rain inevitably washes the ash and eroded soil from



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burnt forests into rivers and streams, shifting the bushfire impact to crucial freshwater ecosystems. As the water fills up with fine sediment and foreign, nutrient-rich material, the water quality can drop very quickly – and stay that way for a long time. Freshwater animals lose oxygen and die because as soon as a fire has passed and the ash settles on rivers and lakes, bacteria in the water will start consuming the carbon in that ash. Changes in the turbidity, or amount of sediment in the water, are another factor that can threaten aquatic species. Some research has also shown that fire mobilizes mercury in runoff.

Sources: <https://e360.yale.edu/features/long-shaped-by-fire-australia-enters-a-perilous-new-era>; www.abc.net.au/news/science/2020-01-09/freshwater-ecosystems-water-catchment-bushfire-impact/11850826; www.nationalgeographic.com/science/2020/01/australian-fires-threaten-to-pollute-water/

The Warragamba Dam-raising project. A group representing 20 NGOs and environmental bodies from across Asia has made a submission to the New South Wales parliamentary inquiry into the project, which would [raise the Warragamba Dam wall by 14 metres](#) that threatens the Blue Mountains World Heritage Area. The plan has drawn criticism from traditional owners and environmentalists who say valuable sacred sites and objects, and flora and fauna, will be destroyed by a higher water level.

Source: www.abc.net.au/news/2019-10-11/warragamba-dam-company-smec-accused-of-abusing-indigenous-rights/11589222

Solomon Islands secures US \$200 million of international funding for the most expensive small hydropower plant project, the cost of which is US \$16 thousand per 1 kW (for comparison, solar photovoltaics costs an average of US \$1.5 thousand per 1 kW). The 15MW [Tina River Hydropower Project](#) is expected to bring down Solomon Islands' reliance on imported diesel by nearly 70%, apart from lowering the prices of electricity. The total project cost is US \$240 million.

Source: www.nsenergybusiness.com/news/solomon-islands-tina-river-hydropower/

Forbes (USA): 'nuclear coffin' is likely leaking waste into the pacific. The United States conducted 67 nuclear weapon tests from 1946 to 1958 on the pristine Marshall Islands. In 1977, the United States worked to clean up the radioactive waste left strewn across the Marshall Islands. The US used a crater from an especially large nuclear bomb test to stash away the radioactive soil. Today, there are growing concerns that the site is leaking one of the most toxic substances in the world, the radioactive isotope plutonium-239, a byproduct of nuclear bombs that decays with a half-life of 24,100 years.

Source: www.forbes.com/sites/trevornace/2019/05/27/fears-grow-that-nuclear-coffin-is-leaking-waste-into-the-pacific/#65396b8a7073

11.5. Europe

11.5.1. Western and Southern Europe

On 11 December, the European Commission presented its [European Green Deal](#) to boost the efficient use of resources by moving to a clean, circular economy, stop climate change, revert biodiversity loss, and cut pollution. The European Green Deal covers all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles and chemicals. Among the main points of the Commission's plan are:

- net-zero GHG emissions by 2050, i.e. Europe's "climate-neutrality";
- creating a toxic-free environment by 2050;
- ecosystems and biodiversity, including presentation of the new Biodiversity Strategy;
- new Strategy for a "greener and healthier agriculture" system, covering the entire cycle of food production and consumption;
- research, development and innovation, with research aimed at developing environmentally friendly technologies (35% of research funding), and research under flagship projects focused primarily on environmental issues; etc.

In December 2019, the European Council and the European Parliament reached political agreement on the text of a proposed Regulation on the Establishment of a Framework to Facilitate Sustainable Investment – the so-called "**Taxonomy Regulation**". The Taxonomy Regulation will establish an EU-wide classification system (or taxonomy) intended to provide firms and investors with a common framework for identifying to what degree economic activities can be considered to be "environmentally sustainable". A coalition of NGOs issued a [Joint Statement – Ten Priorities for the Taxonomy Consultation](#) calling the drafters of technical documentation to remove from the EU Taxonomy activities that threaten freshwater ecosystems, World Heritage and global conservation efforts.

Sources: www.ashurst.com/en/news-and-insights/legal-updates/agreement-reached-on-the-final-text-of-the-eu-taxonomy-regulation-summary/; www.transrivers.org/2019/2837/

Summer 2019 in Europe saw anomaly heatwaves. High temperatures were recorded in June

and July. The Czech Republic, Slovakia, Austria, Andorra, Luxembourg, Poland and Germany all set [new monthly records](#), while France recorded [its highest ever temperature](#) of 45.9 °C. Out of Spain's 50 regions, 40 are under a weather alert, with seven at "extreme risk." A record-breaking heatwave is scorching parts of Europe, sparking wildfires and prompting water restrictions. Farmers, private households and wildlife around Europe are suffering in a drought following last month's record temperatures that scorched much of the continent. In Germany, low water levels forced authorities to cut back on boat travel on the Elbe and Oder rivers. The Rhine River is a key conduit for commerce in Europe, and it is once again facing a traffic shutdown [due to low water levels](#). Last year, boat traffic on the Rhine stopped for the first time in living history as low glacier melt and drought made the shipping lanes too shallow. Last year's low water levels were partly to blame for a contraction in Germany's economy. Experts warn that the exceptional temperatures in Europe are "absolutely consistent" with weather patterns predicted due to greenhouse gas emissions. Several parts of the continent endured extreme temperatures last summer as well. A German climatology institute reported that Europe's five hottest summers in the past 500 years have all occurred in the 21st century!

The first ever Europe-wide inventory of hydropower plants released in December 2019 shows rivers to be saturated with hydropower dams and thousands more on the cards. The study finds that Europe is already saturated with 21,387 hydropower plants; despite this, 8,785 additional plants which are planned or under construction; 28% of all planned hydropower is in protected areas (33% in the EU); 91% of the plants recorded by the study are small plants, which produce negligible amounts of energy (less than 10MW).

Source: www.wwf.eu/?uNewsID=356638

In a historic moment for Europe's rivers, the **first breach was made on 12 June in the 36-metre high Vezins Dam** – kick-starting the biggest dam removal in the continent so far. This landmark event is part of a long-term project to free the Selune River, and bring salmon, eels and other wildlife back to the river and the famous bay of Mont-Saint-Michel – a UNESCO world heritage site and one of Europe's prime tourist attracti-

ons. The dismantling of the Vezins dam – as well as another old obsolete dam, La Roche Qui Boit – will open up 90 km of the Selune River, improving water quality, allowing migratory salmon to return to their ancient spawning grounds, and benefiting people and nature all along the river. Artificial barriers (dams) are one of the biggest threats to river ecosystems, resulting in fragmentation and loss of habitat connectivity. They stop the natural flow of sediments downstream and prevent migratory fishes from travelling up- or downstream to complete their lifecycles. These impediments often lead to the decrease or decimation of native fish populations. As prescribed by the EU Water Framework Directive (WFD), each of Europe's rivers must attain a 'good' ecological status and yet 40% of rivers fall short. Removing old or obsolete dams is a highly effective way for Member States to meet their commitments under the WFD, as it helps to restore a river's connectivity, and facilitates the achievement of good or high status of that river or associated water bodies. It also restores biodiversity and fish stocks. In fact, many countries in Europe are now removing dams as the economic, environmental and social benefits of doing so far outweigh the alternative of restoring the dam. It is estimated that over 3,500 barriers have been removed across Europe including the biggest dam removal in Spain last year and an ongoing historical river restoration project in Estonia that will remove 8-10 dam and open up 3,300km of river basin.

Sources:

https://wwf.panda.org/our_work/our_focus/freshwater_practice/freshwater_news/?347515/Biggest-dam-removal-in-Europe-begins;
www.transrivers.org/2019/2698

Hundreds of new hydropower projects are planned in the Western Balkans, as investors sought to take advantage of the huge and relatively untapped water resources in the region. Now, however, public sentiment is turning against these investments and several have been cancelled or put on hold. In the latest development at the end of February, after [thousands of people protested in the Kosovan city of Peja](#) over plans for a series of hydropower plants on the Lumbardhi River, Prime Minister of the country ordered an immediate halt to construction pending a comprehensive assessment of the scale and impact of the project. Around 6,000 people protested in the Serbian capital Belgrade on January 27 over concerns that the planned construction of hundreds of hydropower plants in the country will damage the environment. The Serbian authorities plan to build more than 850 hydropower plants, about 200 of which will

be within nature reserves such as national and natural parks. Governments in the region are in a tricky situation. As members of the Energy Community, the EU aspiring Western Balkans countries have adopted targets to boost the share of renewables in their energy mix as part of their ongoing integration with EU energy policy. Their starting positions are mixed: Albania outstrips all EU member states since virtually all of the energy it produces is already from hydropower, a renewable resource. Several of the Western Balkans states rely heavily on coal, which has raised concerns about the polluting impact on the region and the wider continent, and there are numerous new coals fired power plants, most of them Chinese funded, in the works. Yet environmental groups say the shift towards more hydropower investment is also problematic, especially when new dams are built in until now untouched rivers. A study published by environmental NGOs claims three quarters of the rivers in the Balkans are ecologically so valuable, they should be completely off limits for hydropower development. While the region could further develop its hydropower potential, it is not reliable enough to guarantee the countries meet their annual power generation needs. Perhaps the most promising opportunity lying ahead is regarding other renewable energy sources. Overall, progress in investing into new forms of renewable energy in the region has been slower than expected.

Source: www.transrivers.org/2019/2561/

In 2019, flooding in Venice was the worst one for the last 148 years. As a result of heavy rains on 17 November, the water in the city rose to 1.5 m, exceeding 1.4 m for the fourth time during the week. Since records began in 1872, that level has never been reached even twice in one year. Flood levels were the second-highest ever recorded, peaking at 187 centimeters (74 inches), just shy of the 194 centimeters recorded in 1966. The flooding inundated over 80% of the historic city. In December, the city was hit by a new flood. Damage from the worst flooding for the last 148 years was € 1 billion. In 2003, construction began on the MOSE Project (system of inflatable gates that would block incoming storm surges), which was scheduled to be completed in 2012. However, cost overruns have tripled the price of MOSE, and the project has been beset by prolonged delays and corruption.

Sources: <https://www.dw.com/en/venice-third-exceptional-flood-makes-week-worst-on-record/a-51286635>;
<https://www.bbc.com/news/av/world-europe-50814519>

11.5.2. Eastern Europe and Caucasus

Armenia

Amendments were made in the Armenian Water Code that introduced a ban on building small hydropower if 10 EIA criteria set by the National Government were not met. Also, those amendments set that licenses for small hydropower will be suspended if water diversion through diversion tunnels exceeds 40% and if river water level lowers below an acceptable limit. The Armenian Government approved the Concept and **Program for Water Saving Technology** to ensure efficient water management in the country (January 17).

International cooperation. An [Agreement](#) was signed between the Government of Armenia and the German KfW Bank for the restoration of the Kaps reservoir for a total of €21.2 million. An investment Agreement was signed with the “Veolia Jur” company for modernization of the water supply network in Armenia for 2.7 billion dram in 2019.

Environment. The Government of Armenia approved the EU's grant of €5 million for solution of environmental problems around Sevan lake and [applied](#) to UNESCO with a proposal to give Sevan the status of biosphere reserve to allow for measures for lake's environmental improvement. For forming a single chain in the production of fish and fish products and for more active water recycling it was [decided](#) to regulate water supply of fish farms in the Ararat Valley and use a closed water supply cycle.

A decision was made by the Government of Armenia to establish an Environmental monitoring center on the base of public non-profit organizations that carried out monitoring at the ministries of environment, agriculture and emergencies.

The 22nd telethon of the All-Armenian Fund “Ayastan”, which was organized under the slogan “For our home Armenia: life-giving water and sun for communities”, collected more than \$10.2 million for a water supply project and a solar energy program to be implemented in Nagorny Karabakh and three provinces of Armenia – Shiraka, Lori and Tavusha.

Sevan HPP, the head plant of the Sevan-Razdan hydropower cascade, passed 70 years of its operation in 2019.

Azerbaijan

In 2019, the water supply and sewage systems started to be reconstructed in the cities of Gakh,

Goradiz, Yevlakh, Neftchala, Mingyachevir, Salyan, Shamkir, Sheki, Shervin, as well as in Sabunchi and Khazar districts of the Baku city. Water supply and sewage systems were put into operation in the cities of Agdash and Gabala. In total, in 2019 it was planned to drill more than 300 subartesian wells to provide population with drinking water in 254 settlements, 41 cities and districts comprising about 736,000 people and supply irrigation water to 80,000 ha.

Construction of a new wastewater treatment plant in the settlement of Pirshagi was completed with the purpose of preventing discharge of wastewater generated over the vast territory in the northeast of the Absheron peninsula into the Caspian Sea. Construction of the largest Shamkirchai water treatment plant, with the total reservoir volume of 165 Mm³ was also finished. The plant will supply with water over 300,000 people in Gyandja, Shamkir and Samukh towns and adjacent villages and will process 140,000 m³ a day. Appropriate work was done for the reconstruction and increase of flow capacity of the Absheron main canal and the improvement of irrigation water supply to agricultural land in Shamakhi district and Nakhchivan Autonomous Republic.

Production processes in “NereMIZ” fish hatchery were organized in Pirallakhi district as part of the Nerekend fish-breeding project. Initially, the annual production capacity of the hatchery on the total area of 6 ha was to be 100 tons of sturgeon, 25 tons of sterlet and 4 tons of caviar. At the end of 2019, fish farms released into republican rivers and lakes 131.7 million of young fish, including 0.3 million of sturgeon and 0.2 million of young salmon.

The State Agency for Alternative and Renewable Energy has developed projects of the total cost of \$1.2 billion for the construction of two wind stations in the Azerbaijan part of the Caspian Sea.

A one-day environmental campaign was organized for planting 650,000 trees on the occasion of the 650-anniversary of poet Imadeddin Nasimi. Tenth jubilee environmental exhibition – Caspian Ecology 2019 – was held in Baku on November 13-15.

Belarus

The Law “**On peatland protection and use**” (No. 272-3) was adopted in the Republic on 18 December 2019. The Law sets the legal framework for the protection and sustainable use of mar-

shes, conservation and restoration of their biospheric functions, meeting of economic and other types of demand of the present and future generations for these resources, and enforcement of the citizens' right for favorable environment and nature use.

Drinking water supply and sewerage. A new version of the Law "On drinking water supply" was adopted (09.01.2020) and the State Production Association "Belvodokanal" was established (16.01.2019) in the structure of the Ministry of Housing and Utilities. The Association will follow the common economic, technical and technological policy in the area of water supply and sewerage, including development of the National strategy for the improvement and development of drinking water supply and sewerage systems in the Republic of Belarus until 2035. The [credit agreement](#) was signed with EBRD for allocation of a sovereign loan of up to €26.8 million to upgrade and reconstruct waste treatment facilities in the cities of Kletsk, Lyuban, Fanipol, Baranovichi, Bereza, Zhlobin and Shklov to meet the corresponding national standards and the standards of the EU. Also, a credit agreement for €15.5 million was signed for implementation of the investment project "Clean water of the Vitebsk province" (2019-2022), which provided for the construction of 80 water supply objects.

SDGs. In 2018, the Belarusian Statistical Committee drafted a Roadmap for the development of statistics on SDG, and the National [platform](#) for reporting indicators of SDGs was established in 2018-2019. The Republican Central Research Institute for Integrated Water Use (RUP "CNIKIVR") with the support of the EUWI+ Project adapted methods for development and calculation of indicators on SDG 6.3-6.5, integrated the methods into the automated information system of the State Water Cadastre, and developed proposals for integration of SDG 6 into national strategies and programs related to water use and protection. Development of river basin development plans was continued for the Dnepr, Western Dvina, Western Bug, Neman and Pripyat rivers to set measures for environmental improvement in the water sites, while meeting the water use requirements (balancing water conservation and use).

The Republic of Belarus was elected the chairman of the **Protocol on Water and Health** to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes for the period of 2020-2022 (Meeting of the Parties to the Protocol, November 19-21). At present, as part of the EUWI+, the country updates national targets that are to be approved in 2020.

Transboundary cooperation. In September 2019, within the framework of the Inter-governmental Agreement between Belarus and Ukraine on **transboundary water sharing and protection**, the Belarusian Ministry of Natural Resources and Environmental Conservation and the Ukrainian State Agency for Water Resources signed a new Technical Protocol on exchange of information on transboundary surface water and groundwater quality, agreed upon the program for monitoring, analysis and assessment of transboundary water and their quality dynamics. The documents are aimed at extending the sphere of joint monitoring. The lists of hydrochemical, hydrobiological, hydrogeological, hydromorphological and radiation indicators for transboundary water observations and of agreed criteria for observation data processing and assessment were supplemented.

The international project "Fostering multi-country cooperation over conjunctive surface and groundwater management in the **Bug and Neman Transboundary Rivers Basins** and underlying aquifer systems" was approved and to be started in 2020-2021 in Belarus, Lithuania, Poland and Ukraine. The total project financing cost is \$12 million.

Symposiums, conferences and forums

1st National Sustainable Development Forum (January 24, Minsk);

International Conference "Modern Trends in Water Supply and Sanitation Development dedicated to the 145th anniversary of Minskvodokanal water services company" (February 13-14, Minsk);

International Scientific-Practical Conference "Nature Management and Environmental Risks" dedicated to the World Environment Day (June 6, Minsk);

XV Republican Ecological Forum "Sustainable Development of Small Cities: Global Challenges and Local Solutions" (June 7-8, Novogrudok);

XXIV Belorussian Energy and Environmental Forum (October 8-11, Minsk).

Georgia

A number of agreements were reached for implementation of **irrigation, water supply and sanitation, and hydrotechnical construction projects** in 2019. In particular, a grant agreement was signed with the Government of Japan for

implementation of the \$61,000-cost project for rehabilitation of irrigation canals and improvement of water and road infrastructure in the Goriy municipality; a Memorandum of Understanding was signed with the South Korean company Korea Hydro&Nuclear Power for joint development of 192.5 MW hydropower project to be constructed in 2021-2026 on the Tskhenistsqali River; an Agreement was concluded with the German Bank of Reconstruction for financing, in the amount of €50 million, of water supply and sanitation project for villages in Kobuleti, Khelvechauri, Khulo, Shuakhevi and Keda districts, as well as the €120 million-credit agreement for the second phase of energy sector reformation and water supply infrastructure modernization in Batumi.

Emergencies. Heavy rains hit Georgia in May 5 and caused largest floods over last decades. Three rivers (Alazani, Stori and Chichakvi) overflowed their banks. The resulting damage is estimated at \$1.8 million. Shower in May 6 caused substantial rise in water level in the Alazani and Inaboti Rivers that led to flooding of more than 1,000 ha. Agriculture was damaged seriously – many vineyards, orchards and vegetable gardens became submerged. Electricity supply of several settlements was broken. The intense rainfall has also led to major floods along other rivers. In particular, on the Nenskra River that resulted in submerging of Mestiyachala HPP-1 building, destruction of a bridge and the catering building; on the Cholshura River, causing damage to roads, bridges and agricultural land.

To improve resilience of population and territories to emergencies, a seven-year Program for **adaptation to climate change** started to be implemented. Particularly, as part of the Program, it is planned to install early warning systems in 11 large river basins.

Moldova

In 2019, the Government of Moldova approved a **draft law on the formation of the State Water Cadastre** and adopted a standard statute on the establishment and activity of a district river basin committee. It is supposed that all water data in the Republic will be integrated into a single information system. The State Water Cadastre will include most complete information on surface and groundwater sources, the data on water quality and pollution sources, and the data on hydraulic structures.

Agreements were reached with some of EU countries and international organizations on **financing water supply and irrigation projects**, particularly: with the German Government on

the Water Supply and Sanitation Project in Ka-gula district; with the Government of Romania on the projects allowing for removal of direct groundwater pollution sources by dismantling damaged and abandoned artesian wells; implementation of adaptation measures in the Byk River Basin; restoration and maintenance of lake ecosystems in Prutului-de-Jos district, which is a part of wetlands enlisted in the Ramsar Convention; and, with the Long-term Development Fund for Moldova on the projects of irrigation system repair and irrigation expansion along the Dniester and Prut Rivers.

An agreement was reached with the Ukrainian Government to suspend construction of the **hydropower cascade along the Dniester River** until the strategic environmental assessment is made in the transboundary context of the “Master plan for multipurpose use of hydropower resources in Ukraine”.

The four-year EU-financed regional project “EU4Environment” was launched. The aim of the project is to assist the Eastern Partnership's countries in preserving and using sustainably the natural capital, improving the natural environment, increasing wellbeing and promoting economic growth.

The International Association of River Keepers “Eco-TIRAS” in partnership with the Institute of Zoology and in collaboration with the Faculty of Natural Geography of the Pridnestrovian State University named after TG Shevchenko organized a conference with international participation “[The Impact of Hydropower on River Ecosystems](#)” (October 8-9, Tiraspol). The Conference was focused on the Dniester River Basin. In the course of the Conference, the participants noted the key role of hydro construction in the ongoing changes in hydrological regime of the rivers and the needs of river ecosystems for water; the need to harmonize and unify approaches of the riparian countries in the Dniester basin to regulation of industrial and recreational fishing in the Lower Dniester basin and the need to transfer to integrated flood management; recommended the riparian countries to expand the network of gauging stations for monitoring the hydrological, temperature and hydrochemical regimes of the river and ensure free availability of information received online, etc.

Russia

Latest developments in legislation

Amendments were made in the **Water Code of RF** concerning the development of a register of unscrupulous water users and water use cont-

ract bidders and the related **Rules for maintenance of the register of unscrupulous water users and water use contract bidders** were approved. The register will include information on water users, whose water use rights were terminated forcibly because of improper use of a water object or the use of a water object in breach of RF laws, as well as on winners of the tender for the right to conclude a water use contract, who resisted concluding the water use contract. After two years since the information has been inputted into the register, this information can be removed from it. The register is to be maintained by the Federal Agency of Water Resources which is obliged to show information from the register on its official website.

A new **Federal program for eradication of water scarcity** was drafted. The Program will cover 7 territorial entities of the Russian Federation: Stavropolie, Crimea, Sevastopol, Ingushetia, Dagestan, Kalmykia, and the Sverdlovsk region.

Convention on the legal status of the Caspian Sea (signed in Aktau on 12 August 2018) was ratified. The Convention sets out fundamental political-military principles of interactions between Kazakhstan, Iran, Turkmenistan, Russia and Azerbaijan in the use of the Caspian Sea for peaceful purposes.

The procedure was approved for development, setting and revision of standards of natural environment's chemical and physical quality, including surface water and groundwater. This would allow for developing a system of quality standards for individual parts of the natural environment and facilitate implementation of federal projects, such as "Clean air" and "Clean water" under the national "Ecology" project (PP RF No. 149 of 13.02.2019).

Amendments were made to the Code of administrative violations (FZ RF No.57-FZ of 15.04.2019), according to which liability is set for administrative violation of the rules of water conservation and water use when mining mineral resources, turf, rotten slime in water bodies and during construction and operation of underwater and above-water structures, in process of fishing, navigation, oil pipe and other pipeline laying and operation, bed deepening, blasting and other operations or during construction and operation of dams, harbor or other facilities, as well as in case of violation of the operation rules of water-management or water-protective structures and facilities. Administrative charges were increased for officers for discharge of hazardous substances into water. The increase in charges should bridge disproportionate sanctions for pollution of air, water, and land.

Implementation of State programs

As part of the **Federal Special Program "Water Development in the Russian Federation in 2012-2020"**, construction of 12 protective engineering structures was completed in 2019. The number of protected population achieved more than 4,800. Completion of 55 projects allowed for increasing capacities of treatment structures by 203 Mm³/year and reducing the discharge of polluted water almost by 10 Mm³/year. The following events were also organized in 2019 under the Program: 6th All-Russian competition of children drawings "Colorful drops", where over 8,000 children took part from 80 regions of the country; 3rd All-Russian environmental quest for students "Water of Russia" that promoted reduced water consumption in 30 higher educational institutions; and, Russia-wide interactive environmental lesson "Water of Russia: Clean water laboratory", which was visited by over 100,000 students. **In 2019, changes were made in FSP**; in particular, resources of the Program were revisited for 2019-2020, taking into account measures to be undertaken to: restore water bodies; ensure efficient water use and sustainable operation of water infrastructure in the Lower Volga; preserve a unique system of the Volgo-Akhtuba floodplain; restore water bodies under the federal projects "Environmental improvement of the Volga" and "Preservation of unique water bodies".

A number of federal projects were implemented as part of the **National "Ecology" Project**:

- **federal project "Clean water"**, which assessed the status of centralized water supply and water preparation systems for their correspondence to standards of quality and safety of drinking water supply;

- **federal project "Environmental improvement of the Volga"**, which for the threefold reduction of a portion of raw sewage discharged into the Volga River by 16 territorial units of RF, assessed sewage treatment systems and helped to approve regional programs for construction and modernization of treatment plants. As a result of measures taken to ensure sustainable functioning of water infrastructure in the Lower Volga and preserve a unique system of the Volgo-Akhtuba floodplain, 3.54 km-long water bodies in the Lower Volga were cleaned, 251.1 ha of water bodies were restored, and 9 discharge facilities were put into operation prior to the scheduled date;

- **federal project "Preservation of unique water bodies"**. For environmental improvement

of lakes and reservoirs, in 2019, conservation efforts were taken and resulted in more than 3,300 ha of restored water bodies, 21.04 km of cleaned irrigation and drainage canals, and 370.5 km of cleaned river channels. The **All-Russian water body cleaning action “Water of Russia”** was organized as a series of eco-marathons, which started in Nizhniy Novgorod in May and finished in Crimea in October. The ecological baton encouraged 8,643 voluntary activities in 85 regions and showed a new record result: over 24,200 km of coastline was cleaned from trash by approximately 940,000 volunteers. In addition, more than 20% of activities promoted waste sorting. As a whole, 10 eco-marathons took place with the support of the Ministry of Natural Resources and Environment of the Russian Federation, the Water Industry Development Center, the Federal Agency “Rosvodresursy” and the Russia’s EKA ecological movement.

Source: www.mnr.gov.ru/docs/openministry/report/

Hydrotechnical construction and reconstruction

The 320 MW **Nizhne-Bureya HPP** was put into operation in the **Amur province**. Given the water regime of the Bureya River, it is expected that the plant will generate 1.67 billion kWh annually. A contract was signed between the PAO RusHydro and the Hevel Group for the construction of the 1,275 kW **solar station** in the area of the Nizhne-Bureya HPP to generate 1.4 million kWh annually. The solar station will allow for reducing the costs of electricity for operation of the Nizhne-Bureya HPP, thus increasing the net electricity supply and improving performance of the HPP.

Innovative equipment – a phase-shifting transformer – allowing for shifting generated capacity to less loaded lines was put into operation at the **Volzhskaya HPP**. It should reduce six times the costs related to connecting increased capacity of HPP to the energy system. The economic effect will exceed 3 billion rouble.

Construction of small HPPs: Krasnogorsk SHPP-1 and SHPP-2; Belopozhsk SHPP-1 and SHPP-2). In 2019, RusHydro and the Karachayevo-Cherkessian Republic signed an Agreement on the construction of Krasnogorsk small HPPs along the Kuban River downstream of the active Zelenchuk HPP. The capacity of each of small HPP will be 24.9 MW, and the average annual generation will be 83.8 million kWh. The plants are to be put into operation in 2021-2022. To bypass current restrictions on the capacity of small HPP (25 MW) and get state subsidies for re-

newables, RusHydro used the unconventional design, which provided for installation of two blocks with energy equipment, 24.9 MW each, in one dam. Similar scheme was earlier applied by NordHydro when designing Belopozhsk small HPPs along the Kem River in Karelia. Construction of those HPPs was to be completed in 2019. However, putting into operation of those plants is questionable even for 2020. This controversial project in Karelia was financed for the first time by the BRICS Bank in Russia. For avoiding “double HPP” in one dam in the future, appropriate changes were made in the Agreement (in early 2020) on joining to the wholesale electricity market trading system when increasing the maximum permissible capacity of small HPPs but not higher than 50 MW in total.

Source: <https://peretok.ru/articles/generation/21889/>

Dam breakage in Siberia. The dam at an artisanal gold mine along the Seiba River in Krasnoyarsk region burst on October 19, 2019. 17 people died, 27 people were injured. The Seiba and the Sisim rivers have become heavily polluted with copper and lead. [Environmentalists](#) have for years tried to draw the attention of authorities to bad mining practices in the Krasnoyarsk region.

In February 2019, generation of the Bureya HPP was restored after elimination of the landslide in the Bureya River. On December 11, 2018, the Bureya reservoir was split into two parts by rock-fall due to largest landslide in Russia. The reservoir lost 28% of its useful capacity, and river streamflow was blocked. This caused the risk of flooding for settlements located upstream of the rock-fall.

Source: <https://regnum.ru/news/economy/2571632.html>

It was decided to **keep the level of the Cheboksar reservoir at 63 m** and not to increase it to the design value of 68 m under public pressure.

Source: <https://regnum.ru/news/economy/2577837.html>

Summer flood in Irkutsk province and further actions of Russian authorities. As a result of high flow in Irkutsk province in June and July, 137 settlements were flooded and over 47,000 people became victims of the flood. Severe damage was recorded in Tulun and Nizhneudinsk cities. In September, the Russian Government corrected the procedure for mapping flooded and water-logging zones. Mapping of flooded zones is needed not only for elimination of negative effects

of the flood in Irkutsk province but also for further development of damaged territories.

Source: <https://sia.ru/?section=18204&id=455>

President's orders concerning Baikal. On the 12th of September, the Russian President approved the list of orders drafted after the audit of compliance with the legislation on preservation and environmental improvement of Lake Baikal and instructed the Government to start executing the orders before January 2020. In October 2019, the Baikal interregional environmental prosecutor stated that virtually the orders have not been implemented. Thus, the Investigative Committee was requested to inspect actions taken by responsible bodies.

Source: <https://iz.ru/935722/2019-10-24/v-prokurature-zaiavili-o-nevypolnenii-poruchenii-putina-po-okhrane-baikala>

Construction of bottling plant at Lake Baikal by Chinese AquaSib was halted. After public outcry organized by the civil movement "Save Baikal" and the community organization "Eco-zaschita 365", the Court of Irkutsk annulled positive findings of the state environmental expertise of the construction. The protest campaign drew attention to other environmental problems of Lake Baikal: consequences of large scale tourism development, wastes, discharge of untreated industrial and municipal sewage, deforestation, and leakage of toxic substances from paper mill.

Source: www.interfax.ru/business/677206

Environmentalists applied to UNESCO in the context of Baikal preservation and potential hydropower development at Selenga's tributary in Mongolia. The application concerning Lake Baikal was driven by the proposed amendments of the Federal Law on Baikal preservation and of the Forest Code that would allow for transfer of land of the forest fund to other categories and for massive sanitation of forests in the central environmental zone of Baikal, as well as for construction of treatment plants and eutrophication of the Lake. The second application refers to the proposed Mongolian Shuren and Orkhon HPP under the MINIS Project and Egjin-Gol HPP beyond the Project.

Source: <https://ircity.ru/news/35931/>

Natural reserve system – A number of national parks, such as Zigalga (Chelyabinsk province), Koigorod (Republic of Komi), Samur (Republic of Dagestan), Tokinsko-Stanovoy (Amur province), and Kytalyk (Yakutiya) were established in

2019. **The area of the "Leopard's land" national park in Primorsk region was extended.** The "Dvinsko-Pinezhskiy" sanctuary was established in Arkhangelsk province. However, challenges were faced as well: plans on the establishment of designated conservation areas (DCA) of federal importance were failed; attempts were continued to soften laws on DCA and withdraw the latter and protected zones, including those included into the list of UNESCO World Heritage (Yugyd Va national park, Pribaikalie national park, Yuzhno-Kamchatskiy park and others).

Source: <https://greenpeace.ru/expert-opinions/2020/01/09/zapovednaja-sistema-rossii-2019-radosti-i-pechali/>

In the International Year of Salmon-2019, a unique publication "The Amur Fish" has come out in Vladivostok with support of WWF-Russia. The Amur River is home to 139 fish species including migratory salmon and kaluga – the largest sturgeon species in the world.

The Russian Government re-considered small hydropower in renewables plan 2025 in favor of solar and wind power. According to the Governmental Decree, 3.94 GW of green power is to be put into operation and new small hydropower is to be reduced over 2019-2024.

Source: <https://peretok.ru/news/generation/20875/>

The only world's floating nuclear heat and power plant was put into operation in Chukotka Autonomous Region in December 2019. The plant is comprised of the coastal infrastructure and the floating "Lomonosov Academician" energy unit, which has been built for over 10 years. The power capacity of the plant is 70 MW, while the heat capacity is 50 Gcal/hr. This is sufficient to supply a city with population of about 100,000.

Source: www.vedomosti.ru/business/articles/2019/12/19/819169-rossii-zarabotala-plavuchaya-stantsiya

International cooperation. 6th meeting of the Water Working Group at the Russia-Iran Joint Commission on Economic and Trade Cooperation (June 16-17, Tehran). The participants exchanged information on public policy and regulation in the sphere of environmental protection and nature management, addressed water-related issues, including integrated water resources management and water governance, water supply and sanitation, and reiterated their interest in developing bilateral cooperation in the area of efficient water use.

Symposiums, conferences and forums

21st International Scientific and Industrial Forum “Great Rivers (environmental, hydrometeorological, and energy security)”. An action for cleaning water bodies and their banks – Water of Russia – was started. Following the Forum, the Resolution “Sustainable regional development in great river basins” was adopted (May 14-17, Nizhny Novgorod);

3rd Russian Water Congress – “Russia’s water resources for achievement of national development goals and strategic objectives” (June 24-26, Moscow);

2nd International Young Water Leader Summit (IYWLS) under the auspices of the [Baikal International Ecological Water Forum](#). The main theme of the Summit was the “Role of youth in achieving sustainable development goals as a driver of the 2030 Program success”. Following the Summit, the Baikal Declaration was signed (September 19-20, Irkutsk);

15th International Symposium and Exhibition “Clean Water of Russia-2019”, the main theme of which was water security as a factor of sustainable development. During the Symposium, the NWO EECCA Conference “Science and Innovations for Water Security” was held. Following the Conference, the collection of papers was published (September 23-24, Yekaterinburg);

1st International Sustainable Development Forum “The Common Future” under the general theme “Success criteria and measurement tools towards the achievement of Sustainable Development Goals” (November 25, Moscow);

1st All-Russian Junior Water Forum, upon conclusion of which it was decided to establish regional junior water communities (November 24-26, Moscow);

International Conference “Water Resources – the Basis of Sustainable Development of Inhabited Area in Siberia and the Arctic in XXI Century” (March 22, Tyumen).

Jubilees

In September 2019, the Federal State Enterprise – Russian Research Institute for Integrated Water Management and Protection celebrated its 50-year jubilee. The Institute has considerable experience in the development and formulation of a conceptual framework of water manage-

ment and of national water governance improvement strategy and largely contributed to the formation of the school of water sciences. Relying on experience gained in the research on Siberian river transfer, the Institute was actively involved in the development of Master Plans for integrated water management and protection and prepared such Master Plans for 14 river basins (See details in [“Science and Innovations”](#)).

Ukraine

Ukraine and Belarus agreed to cooperate on the development of the E40 Waterway. The idea of constructing a shipping route for transportation of goods from Belarus to the ports in the Black Sea, the Mediterranean Sea, and the Caspian Sea has been considered for the last 8 years. In 2019, this issue was included into priorities of the 2030 National transportation strategy of Ukraine and was voiced by the Heads of Belarus and Ukraine in Zhitomir on the 4th of October. The construction project will involve building a port in Nizhniye Zhary at the border of the both states and deepening the Pripyat River. A number of environmental organizations from Belarus, Ukraine, Poland and Europe as a whole oppose the construction of the waterway. They argue that river channel straightening and construction of hydraulic structures would destroy the unique river ecosystem of the Pripyat, the Bug, the Vistula and the Dnieper. The radioactive pollution that would be caused by deepening operations also poses a risk for Ukraine.

Source: <https://bahna.land/ru/reki-i-ozera/lukashenko-i-zelenskij-obsudili-smert-polesya?>

17 sustainable development goals for Ukraine until 2030 were approved and included among others the following goals: ensure availability and sustainable management of water and sanitation for all; take urgent action to combat climate change and its impacts; conserve and sustainably use the oceans, seas and marine resources for sustainable development (Presidential Decree #722 of 30.09.2019).

International cooperation. An inter-governmental credit agreement (€64 million) was signed with France for water supply system reconstruction in Mariupol city and a Memorandum was signed between the Ukrainian Ministry of Ecology and EBRD to develop the mechanism ensuring sustainable development of irrigated agriculture in Ukraine, including modernization of the Lower Dniester irrigation system.

Environment. In July 2019, Ukrainian environmentalists recorded the catastrophic shallo-

wing of the deepest and largest karstic-origin lake in Ukraine – Svitiaz, one of 7 natural wonders of the country.

10 old dams and bay bars were dismantled along the Kogilnik, the Kagach and the Sarata Rivers in the territory of the Danube biosphere reserve in Odessa province. This work was finan-

ced under the project “Restoring the Wetlands and Steppes of the Danube Delta Region”.

[XVII International Trade Fair “AQUA UKRAINE – 2019”](#) took place in Kiev on 5-7 November. It is annually held in Ukraine to introduce the best world standards and advanced achievements in the water sector. The number of visitors exceeded 8,500 from over 10 countries.

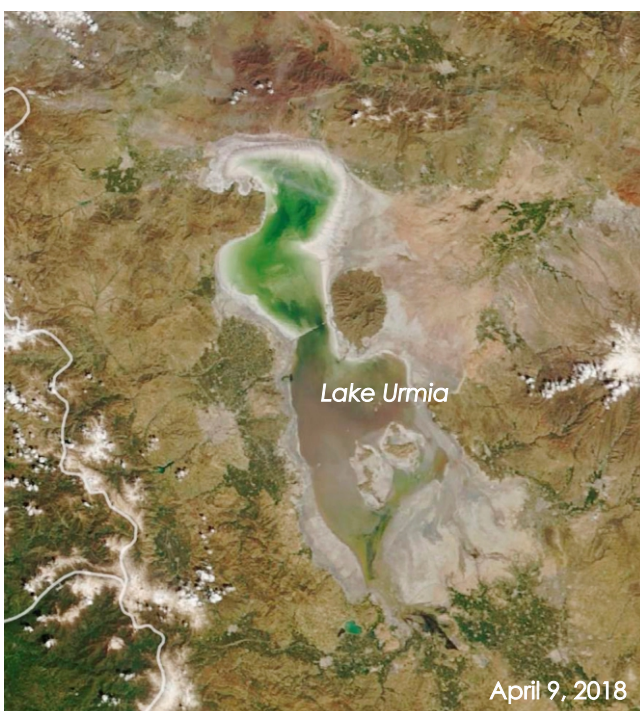
11.6. Middle East

Turkey will start **filling the Ilisu dam on the Tigris River in June 2019**, President Tayyip Erdogan said, despite protests from Iraq. In fact, the gradual filling of the reservoir began in July 2019, but it was not announced publicly. The dam, which has been approved by the Turkish government in 1997 and will generate 1,200 MW of electricity, is a key part of Turkey's Southeastern Anatolia Project, designed to improve its poorest and least developed region. The dam has been criticized for its impact both in Turkey and downstream in Iraq. The Iraqi government says it will create water shortages by reducing flow in one of two rivers which the country depends on for much of its supplies. Around 70% of Iraq's water flows from neighboring countries, including the Tigris and Euphrates, which run through Turkey. In Turkey, the Ilisu dam will displace 50 thousands of people and submerge Hasankeyf dating back 12,000 years. Turkey briefly started filling the dam in June 2018, but it halted temporarily after complaints from Iraq about reduced water flows at the height of summer. Iraq's water shortages have

led it to take measures such as bans on rice planting and have driven farmers to leave their land. Campaigners unsuccessfully challenged the dam project at the European Court of Human Rights on grounds it would damage the country's cultural heritage and violate the right to education. The court dismissed the case in February 2019, saying heritage protection is the responsibility of Turkish authorities and it had no jurisdiction.

Source: www.reuters.com/article/us-turkey-dam-erdogan/erdogan-says-turkey-will-start-filling-ilsu-dam-in-june-idUSKCN1QO1V5

In September 2019, **water level in Urmia Lake has increased by 75 centimeters**, i.e. two billion cubic meters compared to the same month in the year before. In June, the surface area of Urmia Lake increased by 829 square kilometers, thanks to the two-month-long springtime showers that began pouring across the country in March. Located between the provinces of East and West Azarbaijan, Urmia Lake is a closed wa-



ter body fed through 21 permanent and 39 seasonal rivers. It was Iran's largest inland body of water less than 20 years ago; however, it began drying up in the mid-2000s. According to international statistics, the lake lost about 80% of its waterbed by 2015. Several dams constructed near the lake have choked off the water supply from the nearby mountains, contributing to the depletion of the lake. The construction of a 15-km causeway between Urmia and Tabriz has also exerted a severe impact on the reservoir. Now that the lake has been revived by the help of the mother nature, the officials have geared up to implement the long-awaited plans, including water transfer both from domestic and foreign bodies, in order not to let the lake dry up again. Particularly, facilities have been built for the transfer of 0.6 km³ from the transboundary Little Zab River, where the largest HPP in Iraq Kurdistan stands.

Sources: www.waterpolitics.com/2019/10/14/irans-urmialake-water-level-improves/;
<https://earthobservatory.nasa.gov/images/144848/reviving-the-shriveled-lake-urmia>

In November 2019, Jordan's king Abdullah II announced that two pieces of land leased by Israel would be returned to the "full sovereignty" of Jordan as the two countries marked a chilly 25th anniversary of their landmark peace agreement. According to the peace treaty inked by Jordan and Israel on October 26, 1994, the two territories of Baqoura (Naharayim) and Ghamr (Zofar) were leased to Israel for a 25-year renew-

able period. Under the agreement, the lease is automatically renewable unless either side gives a year's notice to terminate it. The deal allowed the Tel Aviv regime and Israeli farmers to use the two areas in the fertile Jordan Valley – which are recognized Jordanian territory. In exchange, Israel agreed to supply Jordan, which is suffering from a severe water crisis, with 45 million m³ of water every year. In October 2018, King Abdullah II said Amman has already notified Israel that it will not extend the lease, stressing that the two border areas "are Jordanian land and will remain" part of the Arab country. The decision came amid growing public pressure for Jordan to reclaim the lands. At the time, Israeli Agriculture Minister Uri Ariel threatened that water supplies to Amman would be reduced from four to two days a week if Jordan terminated the agreement of the 1994 peace treaty.

Source: www.presstv.com/Detail/2019/10/26/609595/IsraelJordan-King-Abdullah-II-water-deal-Ariel-Sharon

The 1st Mesopotamia Water forum took place on April 6-8, 2019 in Sulaymaniyah, Kurdistan Region of Iraq. The activists working in Syria, Iraq, Turkey and Iran discussed water crisis in the region and denounced the grave impacts of dams and other water infrastructures on social structures, river ecosystems, cultural heritage, and local economies.

Source: www.transrivers.org/2019/2613/





Section 12

Thematic Reviews

12.1. Climate Change

State of the Climate Indicators in 2019

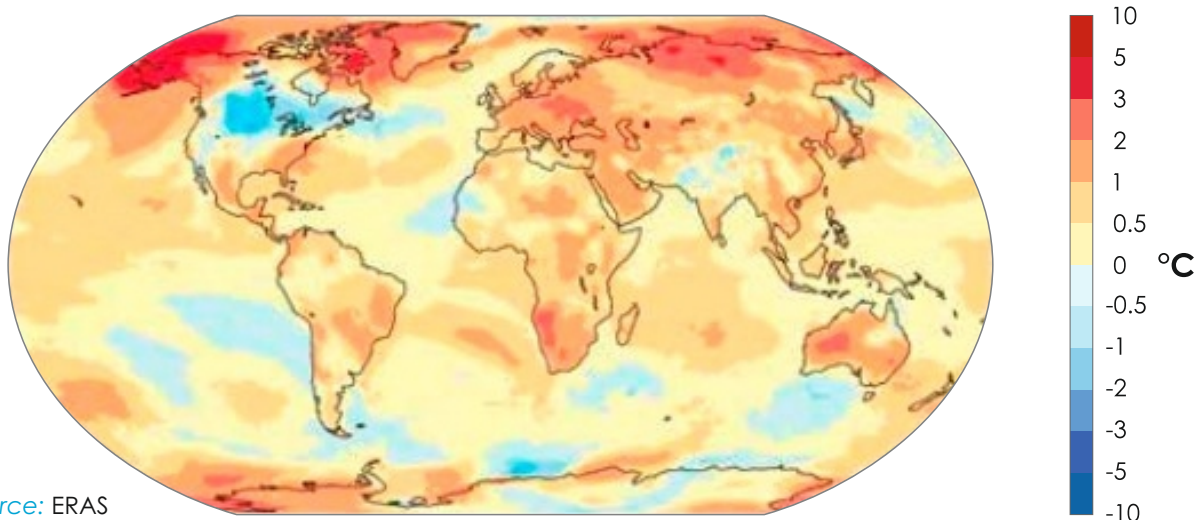
The [WMO Statement](#) on the State of the Global Climate in 2019 provides the following key climate indicators.

Temperature. 2019 was the second warmest year in the instrumental record. 2015-2019 are the five warmest years on record, and 2010-2019 – the warmest decade on record. Since the 1980s, each successive decade has been warmer than any preceding decade since 1850.

2019 ended with a global average temperature of 1.1°C above estimated pre-industrial levels, second only to the record set in 2016, when a very strong El Niño event contributed to an increased global mean temperature atop the overall warming trend.

Greenhouse gases. A preliminary projection of global fossil CO₂ emissions using data from the first three quarters of 2019 suggests that emis-

Surface-air temperature anomaly for 2019 with respect to the 1981-2010 average



Source: ERAS

sions would grow +0.6% in 2019 (with a range of -0.2% to +1.5%).

Oceans. More than 90% of the excess energy accumulating in the climate system as a result of increased concentrations of greenhouse gases goes into the ocean. In 2019, ocean heat content down to a depth of 2 kilometers exceeded the previous record highs set in 2018. In 2019, the ocean experienced on average nearly 2 months of unusually warm temperatures. At least 84% of the ocean experienced at least one marine heatwave. In the decade 2009-2018, the ocean absorbed around 23% of annual CO₂ emissions, cushioning the impacts of climate change but increasing ocean acidity. Since the middle of the last century, there has been an estimated 1-2% decrease (77 billion-145 billion tons) in the global ocean oxygen inventory. Deoxygenation alongside ocean warming and acidification is now seen as a major threat to ocean ecosystems and the wellbeing of people that depend on them. Coral reefs are projected to decline to 10%-30% of former cover

at 1.5°C warming, and to less than 1% at 2°C warming. In 2019, the global mean sea level reached its highest value on the record.

Ice coverage. The continued long-term decline of Arctic sea ice was confirmed in 2019. The September monthly average extent (usually the lowest of the year) was the third lowest on record with the daily minimum extent tied for second lowest.

The Greenland ice sheet has recorded nine of the 10 lowest surface mass balance years in the last 13 years. And 2019 was the 7th lowest on record. The loss in 2019 was 329 Gt, well above the average.

Glaciers. Preliminary results from the World Glacier Monitoring Service indicate that 2018/19 was the 32nd consecutive year of negative mass balance for selected reference glaciers. Eight out of the ten most negative mass balance years were recorded since 2010.

Climate-related Impacts

The report devotes an extensive section to weather and climate impacts on human health, food security, migration, ecosystems and marine life.

Health. In 2019, record-setting high temperatures from Australia, India, Japan, and Europe negatively affected health and well-being. In Japan, a major heat wave event resulted in over 100 deaths and an additional 18,000 hospitalizations. In France, over 20,000 emergency room were recorded for heat-related illnesses between June and mid-September and during two major summer heatwaves, there were a total of 1,462 excess deaths in the affected regions. In 2019, the world experienced a large increase in dengue cases.

Food Security. The food security situation deteriorated markedly in 2019 in some countries of the Greater Horn of Africa due to climate extremes, displacement, conflict and violence. By late 2019, about 22.2 million people, (6.7 million in Ethiopia, 3.1 million in Kenya, 2.1 million in Somalia, 4.5 million in South Sudan, 5.8 million in the Sudan) were estimated to be severely food insecure.

Displacement. More than 6.7 million new internal disaster displacements were recorded between January and June 2019, triggered by hydrometeorological events such as Cyclone Idai in Southeast Africa, Cyclone Fani in South Asia, Hurricane Dorian in the Caribbean, and flooding in Iran, the Philippines and Ethiopia. This number was forecast to reach close to 22 million in 2019, up from 17.2 million in 2018.

High impact events

Floods. More than 2,200 lives were reported to have been lost in various flooding episodes in India, Nepal, Bangladesh and Myanmar during the monsoon season, which started late but finished with rainfall totals above the long-term average. There was major flooding in northern Argentina, Uruguay and southern Brazil, with losses in Argentina and Uruguay estimated at US \$2.5 billion. The Islamic Republic of Iran was badly affected by flooding in late March and early April.

Drought. Drought affected many parts of South-East Asia and Australia, which had its driest year

on record, influenced by the strong positive phase of the Indian Ocean Dipole. Southern Africa, Central America and parts of South America received abnormally low precipitation amounts.

Heatwaves. Australia finished the year where it started: with extreme heat. The 2018-2019 summer was the hottest on record. Australia's seven hottest days on record, and nine of the 10 hottest, occurred in 2019.

Wildfires. It was an above-average fire year in several high-latitude regions, including Siberia (Russian Federation) and Alaska (US), with fire activity occurring in some parts of the Arctic where it was previously extremely rare.

The severe drought in Indonesia and neighboring countries led to the most significant fire season since 2015. The number of reported fires in Brazil's Amazonia region was only slightly above the 10-year average, but total fire activity in South America was the highest since 2010, with Bolivia and Venezuela among the countries with particularly active fire years.

Australia experienced an exceptionally prolonged and severe fire season in the later part of 2019 with repeated major outbreaks.

Tropical cyclones. Tropical cyclone activity globally in 2019 was above average. The Northern Hemisphere had 72 tropical cyclones. The 2018-19 Southern Hemisphere season was also above average, with 27 cyclones.

Tropical Cyclone Idai made landfall in Mozambique on 15 March as one of the strongest known on the east coast of Africa, resulting in many casualties and widespread devastation. Idai contributed to the complete destruction of close to 780,000 ha of crops in Malawi, Mozambique, and Zimbabwe, further undermining a precarious food security situation in the region.

One of the year's most intense tropical cyclones was Dorian, which made landfall with category 5 intensity in the Bahamas.

Typhoon Hagibis made landfall west of Tokyo on 12 October, causing severe flooding.

Source: WMO, https://library.wmo.int/doc_num.php?explnum_id=10211

Climate Change Agreement

As of February 2020, the Paris Agreement, which entered into force on 4 November 2016, has been ratified by 189 Parties⁸⁴. On October 17, 2019, [following the ratification by Kyrgyzstan](#), all Central Asian countries became parties to the Agreement.

The 25th Conference of the Parties (COP25) to the United Nations Framework Convention on Climate Change was held in December 2-13, 2019 in Madrid, Spain under the chairmanship of Chile. The final document "[Chile Madrid Time for Action](#)" calls for urgent and ambitious global climate action; stresses the urgency of enhanced ambition in order to ensure the highest possible mitigation and adaptation efforts by all Parties;

re-emphasizes the urgent need to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. It also recalls the commitment made by developed country Parties, in the context of meaningful mitigation actions and transparency on implementation, to a goal of mobilizing jointly US \$100 billion per year to address the needs of developing country Parties. COP26 is to be held from 9 to 20 November 2020 in the UK in partnership with Italy. Signatory countries will be asked to raise their commitments on climate action. It's the end of the first 5-year cycle under the "ratcheting up" mechanism, designed to boost emissions cuts over countries' initial pledges.

Reports on Climate Change

IPCC New Report

The Intergovernmental Panel on Climate Change (IPCC) presented its new report "Climate Change and Land: IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems" (August). This report shows that better land management can contribute to tackling climate change, but is not the only solution. Reducing greenhouse gas emissions from all sectors is essential if global warming is to be kept to well below 2°C, if not 1.5°C. Agriculture, forestry and other types of land use account for 23% of human greenhouse gas emissions. At the same time, natural land processes absorb carbon dioxide equivalent to almost a third of carbon dioxide emissions from fossil fuels and industry. Roughly 500 million people live in areas that experience desertification. Drylands and areas that experience desertification are also more vulnerable to climate change and extreme events including drought, heatwaves, and dust storms, with an increasing global population providing further pressure. The report sets out options to tackle land degradation, and prevent or adapt to further climate change. It also examines potential impacts from different levels of global warming.

Summary for Policymakers:
<https://ipcc.ch/report/srccl/>

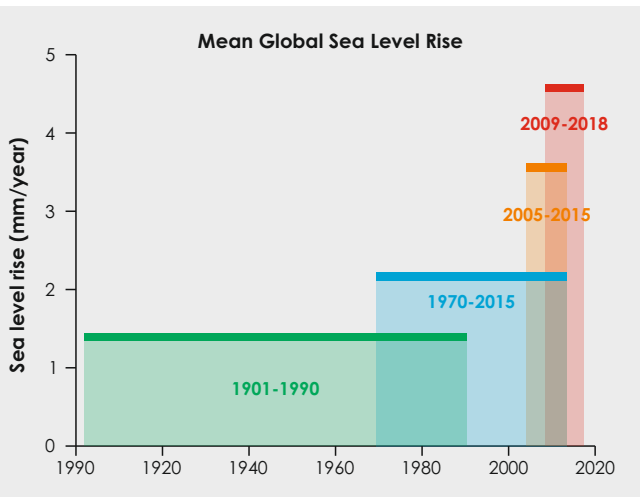
The 10 New Insights in Climate Science 2019 ([full report](#)) intends to take up the latest and most essential scientific findings published in an extraordinary year – the climate science year in review.

1. The world is not on track: (1) Greenhouse gas emissions continue to increase and the gap between current trends and agreed climate targets has widened; (2) Existing fossil-based infrastructure will, if operated during its full lifecycle, take the world above 1.5°C global warming; (3) The use of coal has slowed down and is declining in many countries but oil and natural gas is still growing; (4) Carbon Dioxide Reduction in some form is likely needed but shouldn't be viewed as a substitute for mitigation.

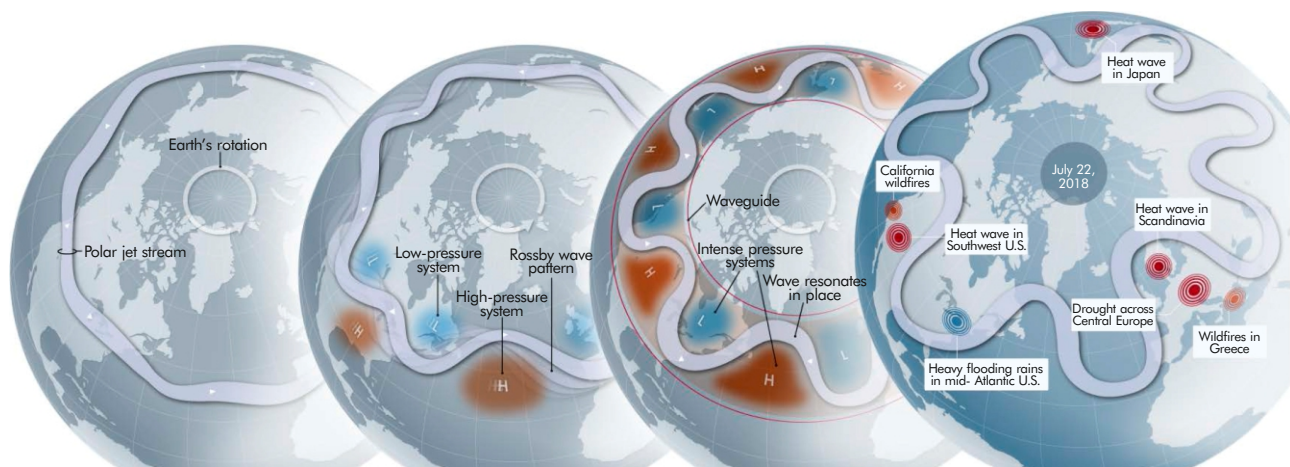
2. Climate change is faster and stronger than expected: (1) Observations show signs of continuing warming, while sea level rise is accelerating; (2) Greenland and parts of Antarctic ice sheets are showing signs of destabilizing much sooner than expected; (3) Further impacts on ice sheets and sea level rise have probably been underestimated in the latest IPCC Assessment Report; (4) High sea-level events that used to happen every 100 years could be experienced every year in megacities around the world by 2050.

3. Climate change leaves no mountain summit behind: (1) Glaciers are on average estimated

⁸⁴ <https://www.climatechangenews.com/2020/08/13/countries-yet-ratify-paris-agreement/>



to have lost about half a meter in thickness per year in 2006-2015; (2) Changes to glaciers, snow and ice in mountains will likely influence water availability for over a billion people downstream by mid-century; (3) Climate change irreversibly affects mountain ecosystems and their biodiversity, reducing the area of biodiversity hotspots and causing species to go extinct; (4) Adaptation to climate change is possible but its effectiveness is severely constrained if high emissions continue.



6. Biodiversity – threatened guardian of Earth's resilience: (1) 14% of local land species could be lost already at 1-2°C warming – more than one third in a business-as-usual scenario; (2) With 2°C warming at least 99% of coral reefs will disappear due to ocean acidification, heatwaves and other pressures; (3) In freshwater, fish die-offs may double by 2050 due to extreme summer temperatures; (4) Natural Climate Solutions are an essential contribution to mitigation, but nowhere near enough to ensure climate stability.

7. Climate change threatens food security and the health of hundreds of millions: (1) Undernutrition will be the greatest health risk of climate

4. Forests are under threat, with global consequences: (1) The World's forests are a major CO₂ sink, absorbing about 30% of anthropogenic CO₂ emissions, forest fires driven by human land-use alteration has been reducing major CO₂ "sinks"; (2) Climate change globally amplifies wild forest fires; (3) "CO₂ fertilization" increases forest photosynthesis capacity, but is increasingly offset by temperature increases that cause tree mortality; (4) Fighting deforestation and encouraging reforestation, along with sustainable forest management and other natural climate solutions are important and cost-effective options for reduced net emissions.

5. Weather Extremes – a "new normal" in 2019: (1) Some extreme weather continues to become more likely and more severe; (2) Increasing number of extremes events but impacts are region-specific; (3) Europe has seen a particularly strong increase in heat extremes; (4) The duration of extreme weather events is anticipated to increase in a 2°C world; (5) Synchronous extremes are risky in a globally-connected world; (6) Societies often don't have time to fully recover from extreme events before another one hits; (7) Ambitious mitigation can curb risks, but with 1.5°C warming regionally dangerous levels will be reached.

change with declining agricultural productivity; (2) Increasing concentrations of carbon dioxide will reduce the nutritional quality of most cereal crops, affecting hundreds of millions of people; (3) Climate change and the rise in carbon dioxide concentrations are projected to result in a 20% reduction in the global availability of protein by 2050; (4) Global fish stocks are set to further decline with climate change, with an additional 10% of the global population facing micronutrient deficiencies as a result.

8. Most vulnerable and poor hardest hit by climate change: (1) Vulnerability to climate change impacts is high in countries and parts of the

population with low incomes; (2) Failure to address and adapt to climate change will have disastrous consequences for hundreds of millions of people and will hinder development in developing countries; (3) Failure to mitigate and adapt could push 100 million people below the poverty line by 2030; (4) Climate change 'hot-spots' will push tens to hundreds of millions to migrate, mainly within borders by 2050.

9. Equity and equality pivotal to successful climate change mitigation and adaptation: (1) Success and failure of climate policies highlight importance of addressing social issues; (2) Social justice is an important factor for societal resilience in the face of climate change, vital for both local and global cooperation to facilitate mitigation and adaptation.

10. Time may have come for social tipping points on climate action: (1) An increasing number of citizens in various countries are seriously concerned about climate change; (2) History shows that 21-25% of a population need to change their behavior to enact significant system-level changes; (3) Deep and long-term transformations driven by a great diversity of actors are needed to meet the Paris Agreement and the SDGs; (4) Recent massive civil protests are getting close to the thresholds where we could expect "tipping" of some socio-economic systems.

Source:
<https://futureearth.org/publications/science-insights/10-new-insights-in-climate-science-2019/>

Adapt Now: A Global Call for Leadership on Climate Resilience. On 10 September, the Global Commission on Adaptation (GCA), headed by Ban Ki-moon along with Bill Gates and Kristalina Georgieva, launched its [report](#) on "Adapt Now: A Global Call for Leadership on Climate Resilience". It is becoming increasingly clear that in many parts of the world, our climate has already changed and we need to adapt with it. "We are the last generation that can change the course of climate change, and we are the first generation to live with the consequences," said Mr. Ban Ki-moon at the launch of the Report in Beijing. The Report provides for investing US \$1.8 trillion globally from 2020 to 2030 in five areas of climate adaptation:

1. Early warning systems for storms, tsunamis and other extreme weather events to save lives as much as possible;
2. Climate-resilient infrastructure. All construction works (roads, houses, bridges, etc.) should comply with the highest quality standards;

3. Mangrove forest protection. Forest restoration and avoided deforestation should protect from landslides and storms, especially in coastal and mountainous areas;

4. Improved farming by switching to drought-resilient crops. Scientists also recommend abandoning those crops that have a negative impact on the soil;

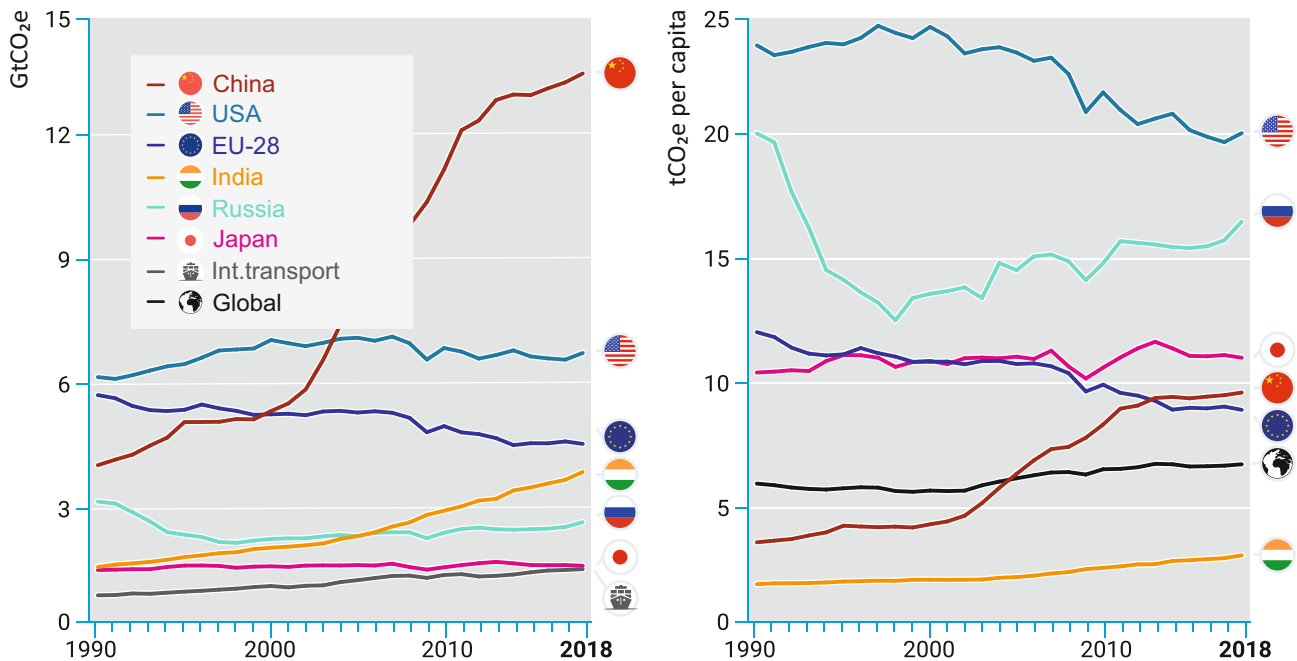
5. Increased volume of fresh water. In addition to effectively saving available resources, developed countries need to launch projects to increase freshwater sources, including technical assistance for developing countries to support nature-based adaptation measures at scale.

Report available on:
https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf

UNEP issued the 10th edition of the UN Environment Emissions Gap Report (26 November). It assesses the latest scientific studies on current and estimated future greenhouse gas emissions and compares these with the emission levels permissible for the world to progress on a least-cost pathway to achieve the goals of the Paris Agreement. It includes the following key conclusions:

1. GHG emissions continue to rise, despite scientific warnings and political commitments.
2. G20 members account for 78% of global GHG emissions. Collectively, they are on track to meet their limited 2020 Cancun Pledges, but several countries (Canada, Indonesia, Mexico, the Republic of Korea, South Africa, the United States of America) are currently not on track to meet 2030 NDC commitments, and for a further three (Argentina, Saudi Arabia and Turkey), it is not possible to say.
3. Although the number of countries announcing net zero GHG emission targets for 2050 is increasing, only a few countries have so far formally submitted long-term strategies to the UNFCCC.
4. The emissions gap is large. In 2030, annual emissions need to be 15 Gt CO₂e lower than current unconditional NDCs imply for the 2 °C goal, and 32 Gt CO₂e lower for the 1.5 °C goal.
5. Dramatic strengthening of the NDCs is needed in 2020. Countries must increase their NDC ambitions threefold to achieve the well below 2 °C goal and more than fivefold to achieve the 1.5 °C goal.

Top greenhouse gas emitters, excluding land-use change emissions due to lack of reliable country-level data, on an absolute basis (left) and per capita basis (right)



6. Enhanced action by G20 members will be essential for the global mitigation effort.

7. Decarbonizing the global economy will require fundamental structural changes, which should be designed to bring multiple co-benefits for humanity and planetary support systems.

8. Renewables and energy efficiency, in combination with electrification of end uses, are key to a successful energy transition and to driving down energy-related CO₂ emissions.

9. Demand-side material efficiency offers substantial GHG mitigation opportunities that are complementary to those obtained through an energy system transformation.

Executive Summary:

<https://wedocs.unep.org/bitstream/handle/20.500.11822/30798/EGR19ESEN.pdf?sequence=13>

Major and Significant Events

UNSC held an open debate on the “Addressing the Impacts of Climate Related Disasters on International Peace and Security” (January 25) and an open Arria-formula meeting on the “Protection of the Environment during Armed Conflict” (December 9) (see “[Security Council](#)”).

The UN Climate Action Summit 2019 was held in New York (September 23) and brought together participants from nearly 200 countries. Building on the momentum of the UN Climate Action

The “[Yearbook of Global Climate Action 2019](#)”

provides an assessment of actions by non-Party stakeholders, defined as regions and cities, businesses and civil society. The Yearbook highlights the launch of the [Climate Ambition Alliance](#); highlights the importance of individual behavior in moving towards climate neutrality; recommends addressing five challenges: (1) viewing climate action holistically to realize increased cooperation across sectors and between actors; (2) removing barriers to implementation and moving away from subsidies and incentives for fossil fuel-related areas and towards incentives for renewable and sustainable solutions; (3) continuing and strengthening the Global Climate Action agenda within the post-2020 UNFCCC process; (4) aligning finance flows with finance needs; (5) strengthening the reporting of results from climate action to inspire others to act.

Summit, GCA is launching a [Year of Action](#). More than 75 governments, institutions, civil society organizations, and private sector actors join as partners to advance eight Action Tracks provided further. The findings will be presented in October 2020 at the Climate Adaptation Summit hosted by the Netherlands.

In 2019, a 16-year-old Swedish schoolgirl, Greta Tunberg, was the face of climate protests. On 20 August 2018, she sat on the steps of the Swedish

<p>1. Food Security and Rural Livelihoods</p>	
<p>Increase resilience to climate change for smallholder farmers in low-income countries</p>	
<p>2. Finance</p>	
<p>Scale up finance for adaptation and de-risk financial flows (to avoid future costs)</p>	
<p>3. Cities</p>	
<p>Improve resilience of cities to climate shocks and stresses</p>	
<p>4. Infrastructure</p>	
<p>Ensure new infrastructure investments are climate-proof</p>	
<p>5. Natural Environment</p>	
<p>Increase the use of nature-based solutions to help communities adapt to climate change</p>	
<p>6. Locally Led Action</p>	
<p>Mobilize finance for small-scale adaptation needs</p>	
<p>7. Water</p>	
<p>Manage water better to boost the resilience of cities, agriculture, and nature</p>	
<p>8. Disaster Risk Management</p>	
<p>Preventing hazards from becoming disasters</p>	

parliament for the first time holding a sign that read “School Strike for Climate”. This marked the beginning of the “Friday for the Future” movement of schoolchildren concerned about climate change. The idea is that on Fridays, instead of going to schools, schoolchildren take to the streets in an effort to draw attention of politicians and the public to the climate crisis. In the course of the year, Greta spoke at various international events, including the UN Climate Action Summit on September 23, 2019 in New York. Thunberg has received both strong support and strong criticism for her efforts from politicians and the press. She has received a number of awards and became TIME’s 2019 [Person of the Year](#).

Human rights and environmental NGOs believe that forming a climate friendly image of hydropower neglects negative environmental and social consequences of HPPs. A [joint statement](#) “The False Promises of Hydropower: How dams fail to deliver the Paris Climate Agreement and the UN Sustainable Development Goals” was launched by Civil Society Organizations on the 13th of May on occasion of the 2019 World Hydropower Congress in Paris, France. On 10 December, 276 civil society organizations from around the world [called upon](#) the Climate Bonds Initiative to abandon the certification of destructive hydropower projects as climate-friendly.

Global trends in climate change litigation in 2019. Climate change litigation continues to expand across jurisdictions as a tool to strengthen climate action, influence policy outcomes and corporate behavior. Climate change cases have been brought in at least 28 countries, with the top countries based on recorded cases are the United States (1,023 cases), followed by Australia (94), the United Kingdom (53), New Zealand (17), Canada (16), and Spain (13). Despite significant capacity constraints, the number of legal cases in low- and middle-income countries has been growing in quantity and importance. These include cases in Pakistan, India, the Philippines, Indonesia, South Africa, Colombia and Brazil. In the United States, an analysis of outcomes of 873 climate lawsuits between 1990 and 2016 found that, for those which have been decided and for which data is available, more outcomes favored ‘hindering’ positions compared with ‘favorable’ positions, with a ratio of about 1.4:1. Outside the United States, 43% of the 305 cases brought between 1994 and May 2019 have led to an outcome that is considered favorable to advancing climate change efforts, while 27% of cases analyzed have hindered climate change efforts – a ratio of about 1.6:1. The majority (aro-

und 80%) of cases focus on mitigation rather than adaptation. The majority of climate-related cases are brought by citizens, corporations and NGOs against governments but lawsuits are increasingly targeting the highest greenhouse-gas-emitting companies. Climate change-related claims are also being pursued by investors, activist shareholders, cities and states.

Source: Setzer J and Byrnes R (2019) Global trends in climate change litigation: 2019 snapshot. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science.
www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/07/GRI_Global-trends-in-climate-change-litigation-2019-snapshot-2.pdf

Databases on Climate Change Law and Litigation. Climate Change Laws of the World and Climate Change Litigation of the World are open-access databases collected by Grantham Research Institute on Climate Change and the Environment and Sabin Center for Climate Change Law. Climate Change Laws of the World Database covers national-level climate change legislation and policies. Climate Change Litigation of the World Database features climate litigation cases from over 30 countries.

The datasets are available on: <https://climate-laws.org/>

Juliana v. United States climate change lawsuit. The first case of its kind, Juliana v. the United States continued in 2019. 21 American teenagers aged from 9 to 20 filed a lawsuit against the US Government. Their complaint asserts that, thro-

ugh 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 resources⁸⁵. At a [hearing](#) in the case held by the Ninth Circuit Court of Appeals [a US federal court preceding the Supreme Court] on 4 June 2019, a three-judge panel remained skeptical of whether the court had any role to play in dealing with the landmark case. Their decision could have important implications on whether or not the courts can be used to pursue climate action in the US.

At the European level, the first litigation was initiated by a group of ten families from eight countries – France, Portugal, Romania, Italy, Germany, Sweden, and also Kenya and Fiji – in May 2018. The plaintiffs of the [People's Climate Case](#) took the European Parliament and the Council of the European Union to the European General Court (EGC) for having allowed too high a level of GHG emissions. According to a [press release](#) from the People's Climate Case in April 2019, the plaintiffs called on EU leaders to reduce GHG emissions by 55% by 2030 (compared to 1990), instead of the target of 40%. According to them, the currently set target is "inadequate with respect to the real need to prevent dangerous climate change and far from what is needed to protect our fundamental rights of life, health, occupation and property". While recognizing that climate change affects all Europeans in different ways, the EGC dismissed the case on procedural grounds in May 2019, saying the plaintiffs did not have a right to go to court to challenge the EU's 2030 climate target. The families who initiated the lawsuit plan to appeal to the European Court of Justice.

12.2. Sustainable Development Goals: Tracking the Progress

Global Sustainable Development Report-2019: Science for Achieving Sustainable Development

The report "The Future is Now: Science for Achieving Sustainable Development", is the first quadrennial Global Sustainable Development Report prepared by an independent group of scientists appointed by the UN Secretary-General. Despite considerable efforts, we are not on track to achieve the SDGs by 2030 (see picture below).



The currently available evidence shows that no country is on track in reconfiguring the relationship between people and nature in a sustainable manner. No country is yet convincingly able to meet a set of basic human needs at a globally sustainable level of resource use. This is illustrated in figure below, which shows the sta-

⁸⁵ <https://www.ourchildrenstrust.org/juliana-v-us>

Projected distance from reaching selected targets by 2030 (at current trends)

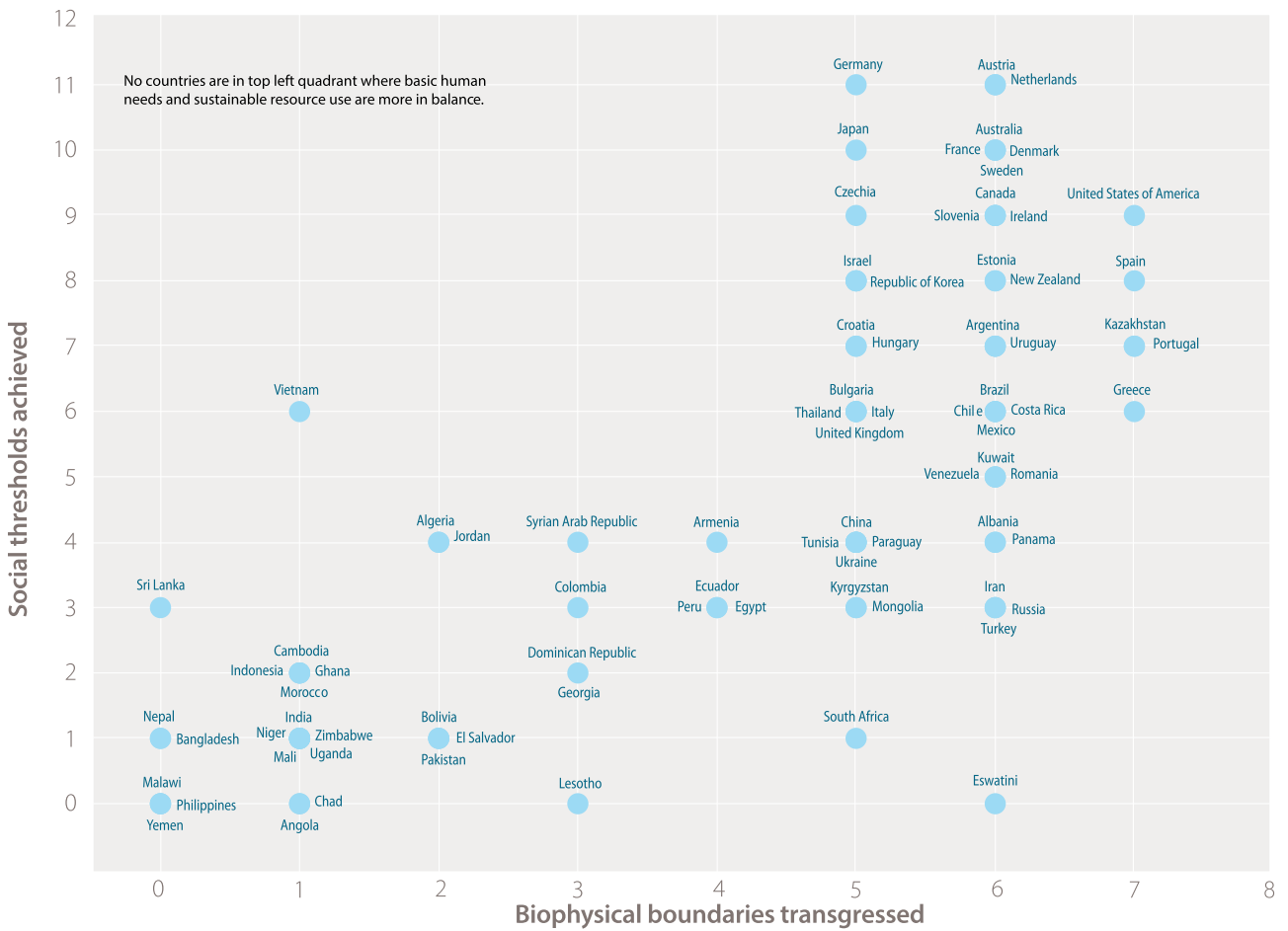
GOAL	WITHIN 5%	5–10%	>10%	NEGATIVE LONG-TERM TREND
 Goal 1		1.1. Eradicating extreme poverty	1.3. Social protection for all	
 Goal 2		2.1. Ending hunger (undernourishment)	2.2. Ending malnutrition (stunting) 2.5. Maintaining genetic diversity 2.a. Investment in agriculture	2.2. Ending malnutrition (overweight)
 Goal 3	3.2. Under-5 mortality 3.2. Neonatal mortality		3.1. Maternal mortality 3.4. Premature deaths from non-communicable diseases	
 Goal 4	4.1 Enrolment in primary education	4.6 Literacy among youth and adults	4.2. Early childhood development 4.1 Enrolment in secondary education 4.3 Enrolment in tertiary education	
 Goal 5			5.5. Women political participation	
 Goal 6		6.2. Access to safe sanitation (open defecation practices)	6.1. Access to safely managed drinking water 6.2. Access to safely managed sanitation services	
 Goal 7		7.1. Access to electricity	7.2. Share of renewable energy 7.3. Energy intensity	
 Goal 8			8.7. Use of child labour	
 Goal 9		9.5. Enhancing scientific research (R&D expenditure)	9.5. Enhancing scientific research (number of researchers)	
 Goal 10			10.c. Remittance costs	Inequality in income
 Goal 11			11.1. Urban population living in slums	
 Goal 12				12.2. Absolute material footprint, and DMC
 Goal 13				Global GHG emissions relative to Paris targets
 Goal 14				14.1. Continued deterioration of coastal waters 14.4. Overfishing
 Goal 15				15.5. Biodiversity loss 15.7. Wildlife poaching and trafficking
 Goal 16			16.9 Universal birth registration	

tus of countries according to the extent to which they are meeting social thresholds – that is, minimally acceptable levels of individual and social well-being along multiple dimensions – while transgressing biophysical boundaries – that is, multidimensional assessments of environmental impact. Most of the richer countries are clustered in the top right quadrant, while poorer countries are in the bottom left quadrant. The ideal position – based on national averages, but neglecting intra-country distributions – is the top left quadrant, where countries would be meeting or exceeding social thresholds without transgressing biophysical boundaries.

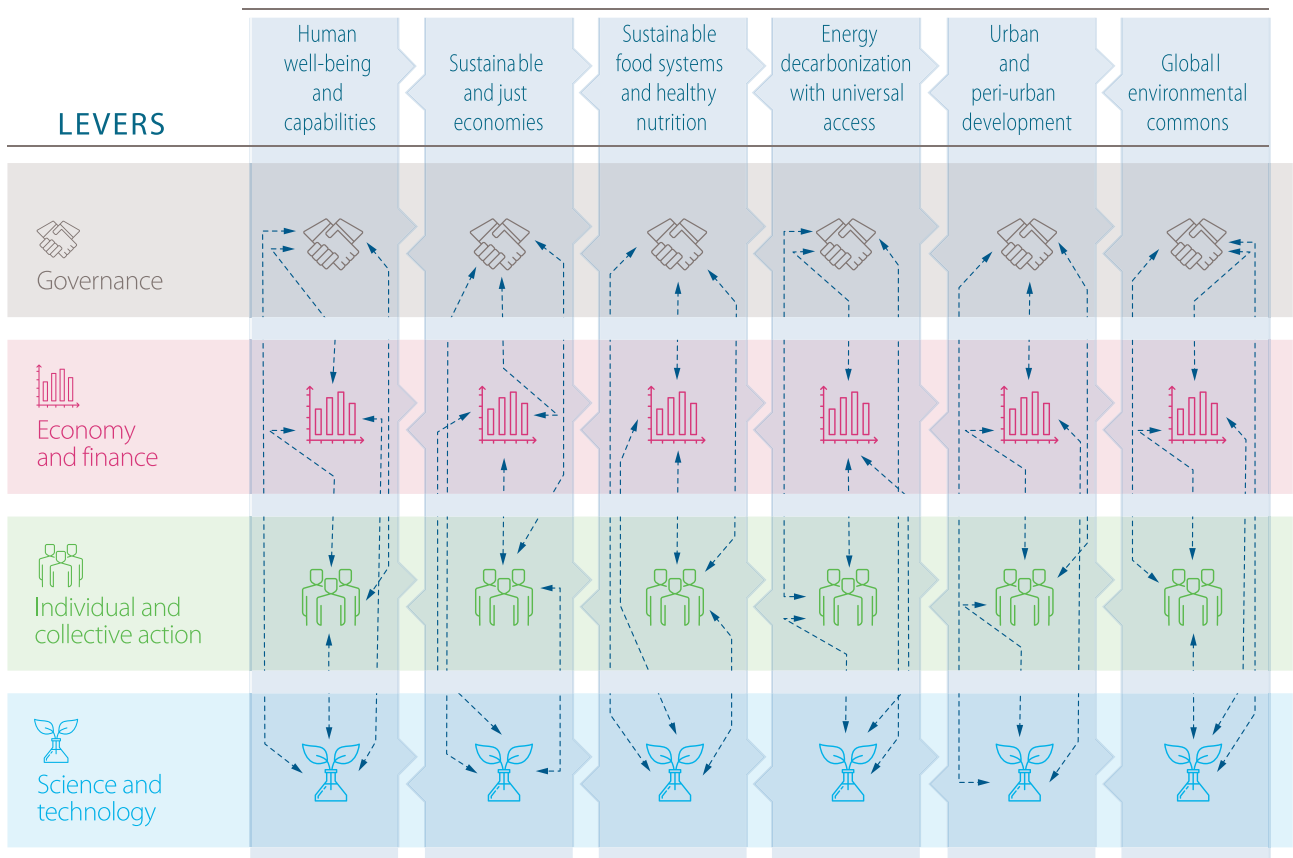
Science is our great ally in the efforts to achieve SDGs. The Global Sustainable Development Report 2019 presents an objective assessment of where we are falling short and what needs to be done. The present Report considers how science can best accelerate the achievement of SDGs. It argues in favor of a sustainability science as a new way for science to contribute directly to sustainable development.

The Report identifies **six entry points** that offer the most promise for achieving the desired transformations at the necessary scale and speed. These include: (1) Strengthening human

Striking the balance: no country is meeting basic human goals within biophysical boundaries



ENTRY POINTS FOR TRANSFORMATION



well-being and capabilities; (2) Shifting towards sustainable and just economies; (3) Building sustainable food systems and healthy nutrition patterns; (4) Achieving energy decarbonization and universal access to energy; (5) Promoting sustainable urban and peri-urban development; (6) Securing the global environmental commons. These are not entry points into individual or even clusters of Goals, but rather into the underlying systems.

The Report also identifies **four levers**, which can be coherently deployed through each entry point to bring about the necessary transformations: (1) Governance; (2) Economy and finance; (3) Individual and collective action; (4) Science and technology. The levers are related to the means of implementation characterized in Goal 17, but are also different, in that they accommodate the multiple, complementary roles that individual actors and entities play in bringing about change. Each lever can contribute

individually to systemic change; however, the present Report argues that it is only through their context-dependent combinations that it will be possible to bring about the transformations necessary for balancing across the dimensions of sustainable development and achieving the 2030 Agenda. As illustrated in the figure above, those combinations are integrative pathways to transformation, which underlie the call to action issued in the Report.

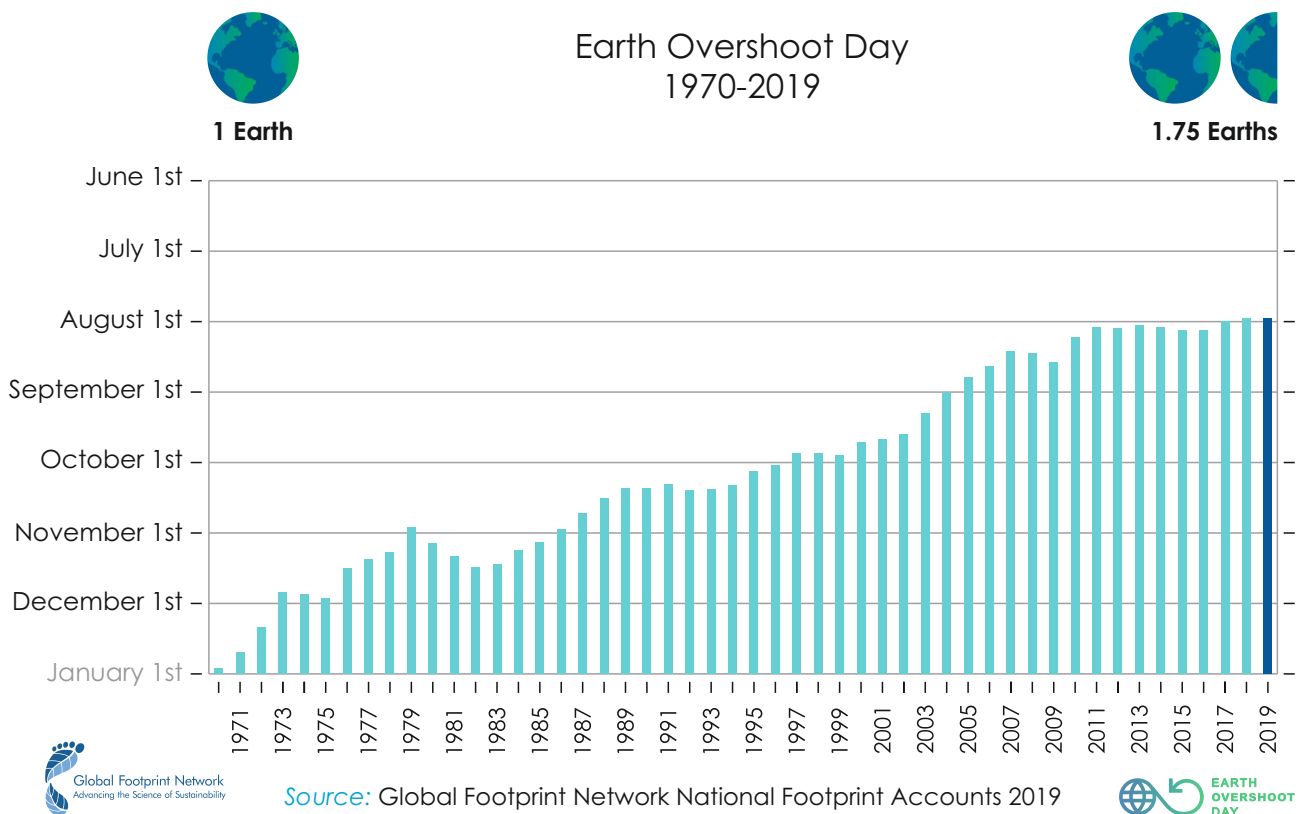
The Report proposes the strategies and call to action for each of the six entry points for transformations, and for improving the role of science in implementing the SDGs.

Source: Independent Group of Scientists appointed by the Secretary-General, Global Sustainable Development Report 2019: The Future is Now—Science for Achieving Sustainable Development, (UN, New York, 2019). https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf

12.3. Earth Overshoot Day 2019

In 2019, the Earth Overshoot Day fell on July 29. It is the date when humanity's annual demand on nature exceeds what Earth can regenerate over the entire year. It is coming earlier each year; for instance, it fell on the end of September in 2000. Humanity is currently using nature 1.75 times faster than our planet's ecosystems can regenerate.

This is akin to using 1.75 Earths. This indicator also depends on levels of consumption in different countries. If all people consumed resources as intensively as in Qatar, the Earth overshoot day would come on February 11. Indonesia runs out of annual resources only by December 18. Russia has been living on "debt" since April 26.



The World Wildlife Fund stresses that to shift the Earth overshoot to December 31 it is needed firstly to reduce carbon dioxide emissions. Cutting CO₂ emissions by 50% would move the date to October. Reducing the consumption of ani-

mal proteins in half will move that day forward by another 15 days. If the ecological footprint remains the same, then by 2030 humanity will need two Earths, and the Earth overshoot day come at the end of June⁸⁶.

12.4. Biodiversity: Key trends and events in 2019

According to the 2019 Global Risks Report, decision makers consider biodiversity loss and ecosystem collapse one of the ten greatest risks facing society today (WEF, 2019). Although biodiversity loss is as great a challenge as climate change, it has received substantially less attention on the political agenda. From ground-breaking research to high-level political engagement, 2019 was an important year for biodiversity. In this review the key moments that made a difference in 2019 are summarized, as well as key findings of the most recent assessments on the state of biodiversity in the world are provided.

What is biodiversity?

Biological diversity (biodiversity) is “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (UN, 1992). In other words, biodiversity is the diversity within species, between species and of ecosystems.

“Biodiversity is the living fabric of our planet - the source of our present and our future. It is essential to helping us all adapt to the changes we face over the coming years” said Audrey Azoulay, UNESCO Director-General

Recent assessments: IPBES, OECD, FAO

In 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)⁸⁷ approved the [four regional assessments](#) on biodiversity and ecosystem services covering the Americas, Asia and the Pacific, Africa, as well as Europe and Central Asia that were written by more than 550 leading experts, from over 100 countries. OECD prepared a

[report](#) for the French the Group of Seven (G7) Presidency and the G7 Environment Ministers' Meeting of 5-6 May 2019 highlighting the economic and business case for the G7 and other countries to take urgent and ambitious action to halt and reverse global biodiversity loss. FAO launches the first-ever global [report](#) on the state of biodiversity that underpins our food systems. It is based on information provided specifically for this report by 91 countries, and the analysis of the latest global data.

This review draws on the findings of these reports.

The key trends in the state of biodiversity

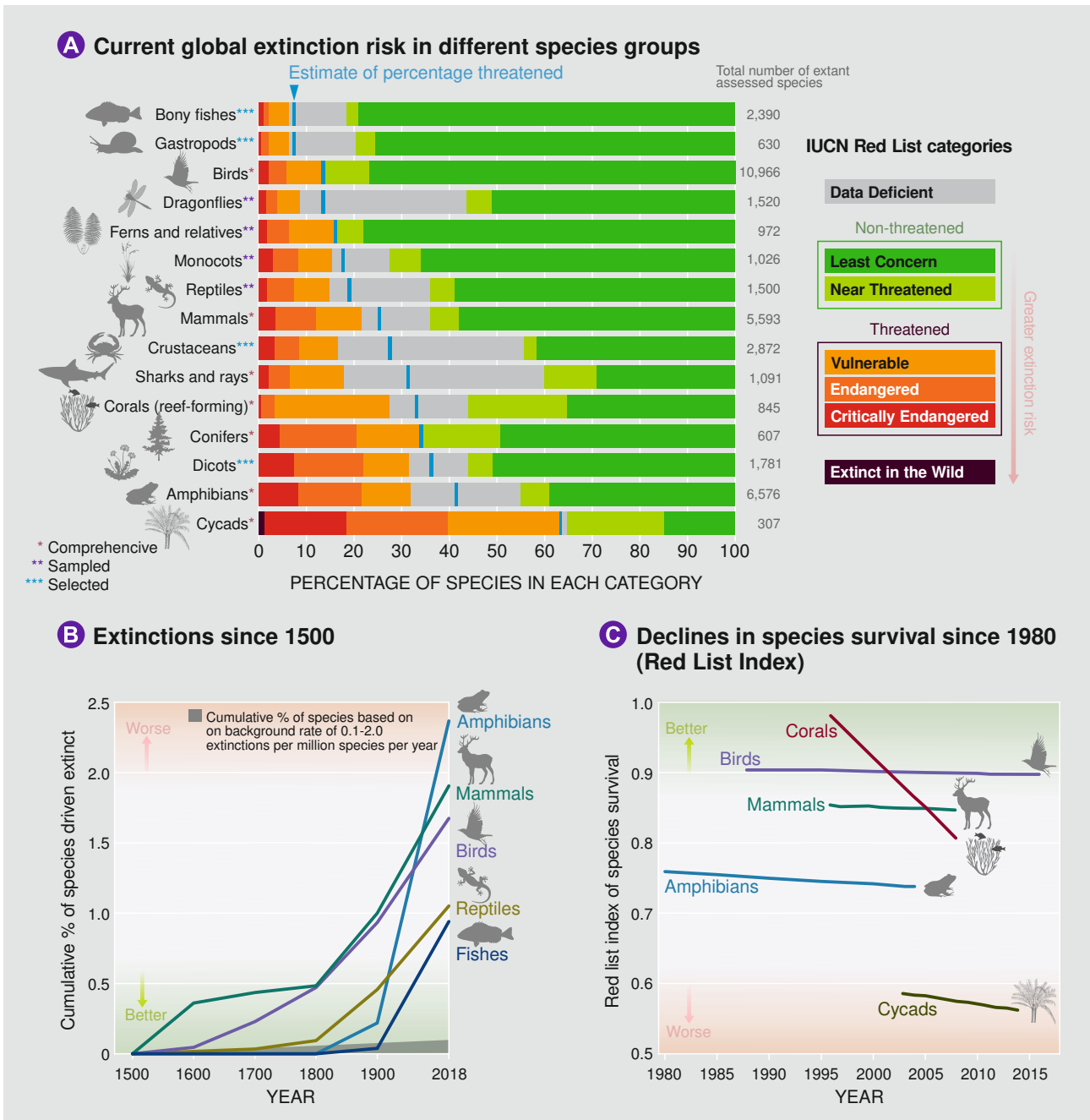
Loss of species and populations

The planet is facing its sixth mass extinction. The current rate of species extinction to be as much as 1,000 times higher than the natural background (pre-human) rate. In the 20th century alone, 477 vertebrates are known to have gone extinct. Between 0.01 and 0.1% of all species will become extinct each year. Species extinction not only represents an irreversible loss of global diversity and its inherent value, it has negative knock-on effects for ecosystem function, productivity and resilience.

The widespread and frequent loss of populations, and declines in the numbers of individual species within remaining populations, are also cause for concern. Species abundance, not just diversity, is an important determinant of ecosystem function and resilience, and the delivery of ecosystem services. The Living Planet Index, which synthesizes trends in vertebrate populations, shows that species have declined rapidly since 1970, with reductions of 40% for terrestrial species, 84% for freshwater species and 35% for marine species.

⁸⁶ <https://www.overshootday.org/>

⁸⁷ IPBES has 129 State Members and four UN Institutional Partners: UNESCO, UNEP, FAO and UNDP



Alteration of terrestrial, marine and other aquatic ecosystems across the globe

Global forest cover continues to decline as demand for food and land increases: global forest area is now approximately 68% of the estimated pre-industrial level. Planted forests have increased, but this increase has been offset by a decline in natural forests, which tend to be more biodiverse. Natural forest area declined by 10.6 million ha per year from 1990 to 2000, and by 6.5 million hectares per year from 2010 to 2015 (FAO, 2019). While the rate of forest loss has slowed globally since 2000, this is distributed unequally. Across much of the highly biodiverse tropics, 32 million ha of primary or recovering forest were lost between 2010 and 2015 (IPBES, 2019). Around 12

million ha of tropical forest worldwide were lost in 2018, with the Amazon alone losing approximately 17% of its size over the last 50 years. The Amazon now absorbs around a third less carbon than it did a decade ago, and a recent study found that increasing dryness in the atmosphere is leaving ecosystems even more vulnerable to fire and drought. The rapid disappearance of more of the rainforest could exacerbate the effects of climate change: if 20% to 25% of the forest is lost, scientists warn that the Amazon could pass a tipping point where a vicious cycle of drought, fire and canopy loss takes hold that cannot be stopped. The destruction of the forests of Borneo offer an ominous precedent: mass deforestation and fires there have led to the loss of over 50% of lowland tropical rainforest (WEF, 2020).

Inland waters and freshwater ecosystems show among the highest rates of decline.

Only 13% of the wetland present in 1700 remained by 2000; recent losses have been even more rapid (0.8% per year from 1970 to 2008) (IPBES, 2019). Natural wetland coverage has declined by an estimated 35% over 1970-2015, and continues to decline at a rate of 0.85-1.6% per year (OECD, 2019).

The state of marine and coastal ecosystems has also deteriorated.

Global mangrove area declined by about 20% between 1980 and 2005 and the coverage of seagrass declined by 29% over the last 100 years (OECD, 2019). Approximately half the live coral cover on coral reefs has been lost since the 1870s.

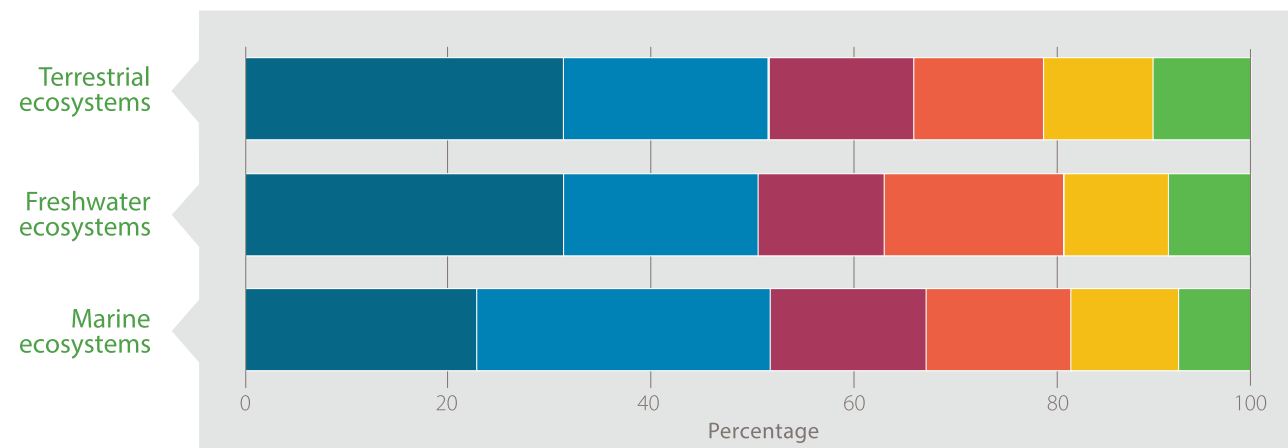
How does human activity endanger biodiversity?

The root cause of biodiversity loss is the growing demand for food, fuel, water and land, combined with inefficiencies and resource misallocation in global production and consumption systems. According to the Global IPBES assessment (2019), the global loss of biodiversity is mainly due to five causes related to human activities (*in decreasing order of impact*): (1) changes in land and sea use, (2) direct exploitation of organisms, (3) climate change, (4) pollution, and (5) invasive alien species (*see picture*).

Human activities drive biodiversity loss

DIRECT DRIVERS

■ Land/sea use change ■ Direct exploitation ■ Climate change ■ Pollution ■ Invasive alien species ■ Others



For terrestrial and freshwater ecosystems, **land-use** change due to agricultural and industrial expansion and urbanization has had the largest relative negative impact on nature since 1970, leading to altered 75% of land surface and the loss of 85% of wetlands. The **world's oceans** has been also impacted, including through direct exploitation, land- and sea-based pollution, and land-/sea-use change, including coastal development for infrastructure and aquaculture.

Direct exploitation of organisms, in particular overexploitation, of animals, plants and other organisms, mainly via harvesting, logging, hunting and fishing is a second powerful threat to biodiversity. Unsustainable fishing remains a major threat to marine ecosystems, with over 30% of fish stocks fished at biologically unsustainable levels (FAO, 2018).

Climate change exacerbates biodiversity loss, negatively affecting species distribution, phenology, population dynamics, community struc-

ture and ecosystem function, which is, in turn, reduces nature's resilience to climate change.

Air, water and soil **pollution** have continued to increase in some areas, leading to habitats being destroyed by untreated urban and rural waste, pollutants from industrial, mining and agricultural activities, oil spills and toxic dumping.

Cumulative records of **invasive alien species** have increased by 40% since 1980, associated with increased trade and human population dynamics and trends. Nearly one fifth of the Earth's surface is at risk of plant and animal invasions.

Risks for societies, economics and environment

Biodiversity and ecosystem services underpin the global economy and human well-being. The dramatic loss of biodiversity brings serious

risks for societies, economies and the health of the people and the planet. Conserving, sustainably using and restoring biodiversity is vital to water and food security, human health, climate-change mitigation and adaptation, disaster risk reduction.

Water security. The mismanagement and degradation of ecosystems is a root cause of water insecurity. To tackle water insecurity, governments must tackle biodiversity loss. Healthy soils, forests, wetlands, grasslands and other ecosystems provide vital hydrological services that can reduce water-related disaster risks, and improve water availability and quality (OECD, 2019).

Food security. Many key components of biodiversity for food and agriculture at genetic, species and ecosystem levels are in decline: the proportion of livestock breeds at risk of extinction is increasing, and that, for some crops and in some areas, plant diversity in farmers' fields is decreasing and threats to diversity are increasing. Nearly a third of fish stocks are overfished and a third of freshwater fish species assessed are considered threatened. Also, increased carbon-dioxide levels are lowering the nutritional value of food staples such as rice and wheat (IPCC, 2019).

Biodiversity lays the foundation of economic development and human well-being

The economic value of biodiversity's contribution to food systems is considerable. Pollination from bees, birds, bats and other species contributes directly to between 5% and 8% of current global crop production. The annual market value of these crops is US \$235-577 billion (IPBES, 2016). The dramatic decline in the abundance of bees and other insects, therefore, poses a considerable economic risk. The loss of all animal pollinators would result in an estimated annual net loss in welfare of US \$160-191 billion globally to crop consumers, and an additional loss of US \$207-497 billion to producers and consumers in other markets (IPBES, 2016; OECD, 2019). Biodiversity is also important to control pest outbreaks. Reducing pesticide use and supporting biological control would help reduce one of the primary threats to bee and other insect populations, while also increasing the efficiency of farms (OECD, 2019). Genetic and species diversity among crops and livestock (and the wild varieties of domestic species) is fundamental to ensuring agricultural systems' resilience to drought, flood, pests and disease. Maintaining genetic diversity allows farmers to adapt their

livestock breeds and crop varieties to changing environmental conditions, reducing the vulnerability of farmers and the global food system (OECD, 2019).

Human health. Well-functioning ecosystems support human health by providing clean air and water, a source of medicines and opportunities for recreational and therapeutic activities. An estimated 50,000-70,000 plant species are harvested for traditional or modern medicine, and around 50% of modern drugs were developed from natural products. In many cases, natural molecules for medical treatments are so complex that scientists are not yet able to chemically synthesize them, so they must harvest and store plants and seeds (WEF, 2020). The most profitable drug to date, atorvastatin (Lipitor), is a cardiovascular drug descended directly from a microbial natural product that posted annual sales of US \$12-14 billion between 2004 and 2014 (OECD, 2019). Biodiversity helps to regulate air quality, reducing morbidity and mortality. OECD estimates the welfare cost from premature deaths stemming from exposure to outdoor fine particles and ozone at US \$5.3 trillion globally in 2017. Investing in nature can help reduce this burden. Trees and forests in the conterminous United States, for example, removed 17.4 million tons of air pollution in 2010, providing health benefits (avoidance of human mortality and incidences of acute respiratory symptoms) valued at US \$6.8 billion (OECD, 2019). Finally, recreational and therapeutic activities such as access and proximity to nature and green spaces correlate with reductions in mortality, cardiovascular disease and depression, and increases in perceptions of well-being (WHO and SCBD, 2015). The physical and mental-health benefits of natural environments (e.g. parks, woodlands and beaches) in the UK are estimated at £2 billion a year (OECD, 2019).

Climate-change mitigation, adaptation and disaster risk reduction. Countries need to decrease greenhouse gas emissions by 25% by 2030 compared to 1990 levels to achieve the 2°C target of the Paris Agreement and 55% to reach the 1.5°C target. Conserving, sustainably managing and restoring ecosystems can provide a substantial and cost-effective contribution to these efforts. Plants and soils in terrestrial ecosystems absorb an estimated 9.5 billion tons of carbon dioxide equivalent every year. Griscom et al. (2017) estimate that conservation, restoration and improved management of forests, grasslands, wetlands and agricultural lands could deliver 23.8 Gt CO₂ of cumulative emission reductions by 2030 (OECD, 2019). In addition to mitigation, biodiversity and ecosystem services play an important role in adapting to the

impacts of climate change, and reducing the risk of climate-related and nonclimate-related disasters. For example, floodplains and wetlands can protect communities from floods. Coral reefs, seagrass and mangroves buffer coastlines from waves and storms. Forested slopes stabilize sediments, protecting people and their assets from landslides. Healthy, connected and biodiverse ecosystems also tend to be more resilient to the effects of climate change than degraded ecosystems.

Socio-economic case for action

According to OECD Assessment (2019), the socio-economic case for more ambitious biodiversity action is clear: **ecosystem services** delivered by biodiversity, such as crop pollination, water purification, flood protection and carbon sequestration, **are worth** an estimated **US \$125-140 trillion per year**, i.e. more than one and a half times the size of global GDP. The nature provides the multiple benefits. For example, coral reefs contribute to the livelihoods of at least 500 million people worldwide, generate US \$36 billion per year for the global tourism industry, and provide vital protection from coastal flooding and storm surges (WEF, 2019).

Between 1997 and 2011, the **world lost** an estimated **US \$4-20 trillion per year in ecosystem ser-**

vices owing to land-cover change and **US \$6-11 trillion per year from land degradation**. Specifically, biodiversity loss can result in reduced crop yields and fish catches, increased economic losses from flooding and other disasters, and the loss of potential new sources of medicine (as the majority of drugs used for healthcare and disease prevention are derived from biodiversity).

The benefits derived from biodiversity and ecosystem services are considerable, but are systematically undervalued or unvalued in day-to-day decisions, market prices and economic accounting. Conventional accounting approaches and measures of economic performance (such as GDP) provide only a limited picture of an economy's health, and generally overlook the costs of ecosystem degradation.

Business and financial organizations can have adverse impacts on biodiversity and ecosystem services through their operations, supply chains and investment decisions, but their valuing of biodiversity impacts remains limited. These organizations depend on biodiversity and ecosystem services for the production of goods and services. Coral reefs alone generate US \$36 billion per year for the global tourism industry. Biodiversity loss can have direct implications on business operations and value chains, e.g. by increasing input costs. The conservation, sustain-

Table 8. Biodiversity and ecosystem values

Scale	Good or service	Estimated annual value
Global	Seagrass nutrient cycling	US \$1.9 trillion
Global	Annual market value of animal pollinated crops	US \$235-577 billion
Global	First sale value of fisheries and aquaculture	US \$362 billion
Global	Coral reef tourism	US \$36 billion
Europe	Ecosystem services from Natura 2000 protected area network	€223-314 billion
Canada	Value of commercial landings from marine and freshwater fisheries	CA \$3.4 billion
France	Recreational benefits of forest ecosystems	€8.5 billion
Germany	Direct and indirect income from recreational fishing	€6.4 billion
Italy	Habitat provision	€13.5 billion
Japan	Water purification from tidal flats and marshes	¥674 billion
UK	Physical and mental-health benefits of the natural environment	£2 billion
USA	Air purification from trees and forest (avoided morbidity and mortality)	US \$6.8 billion

Source: OECD, 2019

nable use and restoration of biodiversity can provide significant business opportunities, including long-term viability of business models; cost savings and increases in operational efficiency; increased market shares; new business models, markets, products and services; and better relationships with stakeholders. The global organic food and beverage market, for instance, is expected to grow 16% per year, to reach US \$327 billion by 2022. Business impacts on biodiversity can result in “responsible business conduct” risks to society and the environment. Biodiversity impacts and dependencies also create risks to business and financial organizations. Relevant risks to business and financial organizations include ecological risks, i.e. operational risks related to biodiversity impacts and resource dependency, scarcity and quality; liability risks, i.e. risk of legal suits; regulatory risks; reputational and market risks, linked to stakeholders’ pressures or preferences changes; and financial risks.

There is a major gap in the finance needed to halt biodiversity loss. Partial data on domestic finance on biodiversity-relevant activities, as reported to the CBD Clearing House Mechanism by 40% of the Parties, was estimated at approximately US \$49 billion in 2015. This estimate is based predominantly on finance from central (and in some cases, state and local) government budgets.

Legal and Policy Response

Biodiversity-related Conventions. Several international conventions focus on biodiversity issues: the Convention on Biological Diversity (1993), the Convention on Conservation of Migratory Species of Wild Animals, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975), the International Treaty on Plant Genetic Resources for Food and Agriculture (2004), the Ramsar Convention on Wetlands (1971), the World Heritage Convention (1972) and the International Plant Protection Convention (1952). Biodiversity-related conventions work to implement actions at the national, regional and international level in order to reach shared goals of conservation and sustainable use. In meeting their objectives, the conventions have developed a number of complementary approaches (site, species, genetic resources and/or ecosystem-based) and operational tools (e.g., programs of work, trade permits and certificates, multilateral system for access and benefit-sharing, regional agreements, site listings, funds). Participation of the Central Asian countries in key biodiversity related conventions presented in Table 9.

The Convention on Biological Diversity (CBD), the key agreement on biodiversity issues, entered into force on 29 December 1993. It has three main objectives; (1) The conservation of biological diversity; (2) The sustainable use of the components of biological diversity; (3) The fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Conference of the Parties (COP) has established seven thematic programs of work which correspond to some of the major biomes on the planet: [Agricultural Biodiversity](#); [Dry and Sub-humid Lands Biodiversity](#); [Forest Biodiversity](#); [Inland Waters Biodiversity](#); [Island Biodiversity](#); [Marine and Coastal Biodiversity](#); [Mountain Biodiversity](#).

In [decision X/2](#), the COP-10 held from 18 to 29 October 2010 adopted a revised and updated [Strategic Plan](#) for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period. This Plan provided an overarching framework on biodiversity, not only for the biodiversity-related conventions, but for the entire UN system and all other partners engaged in biodiversity management and policy development. The Strategic Plan consists of five strategic goals, including twenty [Aichi Biodiversity Targets](#):

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society;

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use;

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity;

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services;

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building;

To implement the Strategic Plan, the Parties are reviewing, and as appropriate, updating and revising their national biodiversity strategies and action plans ([NBSAPs](#)); developing national [targets](#), using the Strategic Plan and its Aichi Biodiversity Targets as a flexible framework, and integrating these national targets into the updated NBSAPs; using the updated NBSAPs for the integration of biodiversity into national development, accounting and planning processes; monitoring and reviewing [implementation](#) of the NBSAPs and national targets, using indicators.

Table 9. Key biodiversity related conventions and Central Asian countries (2019)

	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
1. Convention on Biological Diversity (CBD) adopted 5 June 1992, in force 29 December 1993 (www.cbd.int/)					
Signature	09.06.92				
Ratification/ Accession	06.06.94	06.04.96	29.10.97	18.09.96	19.07.95
National Biodiversity Strategies & Action Plans	1999 NBSAP	2016 NBSAP (v.3) up to 2024	2016 NBSAP (v.2) up to 2020	2018 NBSAP (v.2) up to 2023	
National Reports	1 st (01.11.01); 2 nd (30.07.02); 3 rd (04.01.06); 4 th (08.07.10); 5 th (21.05.14); 6 th (27.02.19)	3 rd (27.02.06); 4 th (03.02.09); 5 th (18.01.16); 6 th (19.03.19)	1 st (27.02.04); 2 nd (01.02.06); 3 rd (28.07.06); 4 th (30.03.09); 5 th (25.04.14); 6 th (24.08.19)	1 st (16.01.03); 2 nd n.a.; 3 rd (19.03.07); 4 th (20.08.09); 5 th (28.09.15)	1 st (10.02.98); 2 nd n.a.; 3 rd (10.03.06); 4 th n.a.; 5 th (17.08.15)
1a. Cartagena Protocol on Biosafety to CBD adopted 29 January 2000, in force 11 September 2003 (http://bch.cbd.int/protocol/)					
Accession	08.09.08	05.10.05	12.02.04	21.08.08	25.10.19
National Reports	1 st n.a.; 2 nd (2011); 3 rd (2015)	1 st n.a.; 2 nd (2011); 3 rd (2015)	1 st n.a.; 2 nd n.a.; 3 rd (2018)		
1b. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to CBD adopted 29 October 2010, in force 12 October 2014					
Signature			20.09.11		
Ratification/ Accession	17.06.15	15.06.15	12.09.13		
1c. Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety adopted 15 October 2010, in force 5 March 2018					
non-parties yet					
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) adopted 3 March 1973, in force 1 July 1975 (www.cites.org/)					
Accession	20.01.00	04.06.07	30.03.16		10.07.97
National Reports		02/11/18e (2015-2017)			01/11/12e (2009-2010); 11/01/12e (2010-2011); 31/10/15e (2013-2014)
Convention on Conservation of Migratory Species of Wild Animals adopted 6 November 1979, in force 1 November 1983 (www.cms.int/)					
Accession	May 2006	May 2014	February 2001	-	September 1998
Latest National Reports	Report COPI3 (2019)	Report COPI2 (2017)	Report COP13 (2019)	Non-partly Report (2015)	Report COPI3 (2019)
International Plant Protection Convention adopted 6 December 1951, in force 3 April 1952 (www.ippc.int/en/)					
Accession	13.09.10	11.12.03	04.10.10		13.01.20
International Treaty on Plant Genetic Resources for Food and Agriculture (IT PGRFA or International Seed Treaty) adopted 3 November 2001, in force 29 June 2004 (www.fao.org/plant-treaty/overview/en/)					
Accession		01.07.09			
World Heritage Convention adopted 16 November 1972, in force 17 December 1975 (https://whc.unesco.org/en/convention/)					
Accession	29.04.94	03.07.95	28.08.92	30.09.94	13.01.93
Ramsar Convention on Wetlands adopted 2 February 1971, in force 21 December 1975 (www.ramsar.org/)					
Accession	02.05.07	12.03.03	18.11.01	03.06.09	08.02.02

Unfortunately, most countries, including in Europe, will not achieve the Archi targets for 2020 to protect biodiversity. In 2019, the first round of official discussions for a new post-2020 global biodiversity framework took place in Nairobi. The Parties of the CBD Governments will meet in Kunming, China, next year to establish a plan of action. In 2020 during COP15 in Kunming the CBD intends to adopt a [post-2020 global biodiversity framework](#). In its [decision 14/34](#) the COP14 adopted a comprehensive and participatory process for the preparation of the post-2020 global biodiversity framework.

Important Policy Events in 2019

G7 Environmental ministers signed the [Metz Charter on Biodiversity](#) during their meeting (May). Heads of state from the powerful bloc endorsed the Charter during their August Summit, vowing to take action ahead of the UN Biodiversity Conference scheduled for October 2020.

EU adopted [Council conclusions on biodiversity](#) to reaffirm that the EU and its member states will lead and step up efforts to halt biodiversity loss and restore ecosystems (December 19). The conclusions provide political guidance for the work towards a post-2020 global biodiversity framework. The Council also calls upon the Commission to develop without delay an ambitious, realistic and coherent 2030 EU biodiversity strategy as a central element of the European Green Deal.

The UN Secretary-General convened a [UN Climate Action Summit 2019](#) that included a special focus on nature-based solutions and their potential to help limit global warming (September 23). "Investing in nature brings multiple benefits: nature helps us adapt to climate change, become more resilient in the face of natural threats, produce nutritious food sustainably, create green jobs and live in cities based on a circular economy model," UN Deputy Secretary-General Amina J. Mohammed said.

[Woorani Land Rights Victory](#). A legal victory for a small tribe in Ecuador sent a resounding message about the rights of indigenous peoples and local communities to participate in decision making related to their ancestral lands. The Woorani Nation had objected to plans to open up its territories in the Amazon for oil exploration. While the government has the right to develop the land, the court ruled that the tribe was not adequately consulted. Activists said the ruling preserves 500,000 ha of Amazon forest and sets a

precedent for other indigenous and local communities.

Transformative change is needed

IPBES (2019) proposed five main interventions ("levers") can generate transformative change by tackling the underlying indirect drivers of nature deterioration: (1) incentives and capacity-building; (2) cross-sectoral cooperation; (3) pre-emptive action; (4) decision-making in the context of resilience and uncertainty; and (5) environmental law and implementation. Employing these levers involves the following, in turn: (1) developing incentives and widespread capacity for environmental responsibility and eliminating perverse incentives; (2) reforming sectoral and segmented decision-making to promote integration across sectors and jurisdictions; (3) taking pre-emptive and precautionary actions in regulatory and management institutions and businesses to avoid, mitigate and remedy the deterioration of nature, and monitoring their outcomes; (4) managing for resilient social and ecological systems in the face of uncertainty and complexity to deliver decisions that are robust in a wide range of scenarios; and (5) strengthening environmental laws and policies and their implementation, and the rule of law more generally. All five levers may require new resources, particularly in low-capacity contexts such as in many developing countries. Transformations towards sustainability are more likely when efforts are directed at the following key leverage points, where efforts yield exceptionally large effects: (1) visions of a good life; (2) total consumption and waste; (3) values and action; (4) inequalities; (5) justice and inclusion in conservation; (6) externalities and telecouplings; (7) technology, innovation and investment; and (8) education and knowledge generation and sharing.

OECD (2019) identified ten priority areas where G7 and other countries can focus their efforts: (1) Pursue and advocate for specific, measurable and ambitious targets in the post-2020 global biodiversity framework; (2) Encourage business, financial organizations and other stakeholders to establish and share commitments and contributions to biodiversity through the Sharm El-Sheikh to Kunming Action Agenda for Nature and People; (3) Promote policy coherence across different sectors and areas to harness synergies and reduce trade-offs for biodiversity; (4) Scale up the suite of policy instruments for biodiversity and get the economic in-

centives right to ensure biodiversity is better reflected in producer and consumer decision-making; (5) Scale up and align finance for biodiversity from all sources, public and private; (6) Strengthen finance reporting and tracking frameworks; (7) Reform subsidies harmful to biodiversity; (8) Facilitate integration of biodiversity by businesses and financial organizations; (9) Assess and communicate socio-economic dependencies and impacts on biodiversity at relevant geographic scales; (10) Ensure inclusive and equitable transformative change.

FAO (2019) finds that knowledge of the roles of biodiversity in the ecological processes that underpin food and agricultural production needs to be strengthened, and used to develop management strategies that protect, restore and enhance these processes across a range of scales. Establishing effective policy and outreach measures will be needed to support the uptake of management practices that sustainably use biodiversity to promote food and livelihood security and resilience.

nably use biodiversity to promote food and livelihood security and resilience.

This review was prepared by SIC ICWC on the materials of:

IPBES (2019): The global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services;

FAO (2018): The State of World Fisheries and Aquaculture: Meeting the Sustainable Development Goals;

FAO (2019): The State of the World's Biodiversity for Food and Agriculture, J. Bélanger & D. Pilling (eds.);

FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome. 572 pp.;

OECD (2019): Biodiversity: Finance and the Economic and Business Case for Action, report prepared for the G7 Environment Ministers' Meeting, 5-6 May 2019;

WEF (2020): The Global Risks Report 2020

12.5. Mountains

Report of the UN Secretary-General “Sustainable Mountain Development”. At the 74th session of UNGA on 22 July, 2019, the report of the UN General Secretary “Sustainable Mountain Development” was launched. Covering 27% of the world’s surface, mountains are key ecosystems that provide humanity with essential goods and services such as water, food, biodiversity and energy. However, mountain ecosystems are vulnerable to natural disasters, climate-related events and unsustainable resource use. Mountains are home to about 1.1 billion people who are among the world’s poorest: half of rural mountain dwellers face food insecurity. Access to services and infrastructure is lower in the highlands than in other areas. Mountain communities are particularly vulnerable to the impacts of natural hazards because of their high dependence on agriculture (encompassing crops, livestock, fisheries, aquaculture and forestry) as their primary source of livelihood. Alone or in combination, these factors make living in mountain areas increasingly difficult and they are often adverse drivers that compel people to migrate. The recommendations contained in the Report are aimed at building resilience to climate change and disasters and protecting biodiversity; improving livelihoods in mountain areas; leveraging international processes in support of mountain development; developing financial mechanisms and partnerships with the private sector; promoting

governance and inclusive institutions; enhancing research and data.

Source: <https://undocs.org/en/A/74/209>

Mountains and SDGs. The 2030 Agenda includes the following three targets directly related to sustainable mountain development:

- SDG 6.6: by 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;
- SDG 15.1: by 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements;
- SDG 15.4: by 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.

UNGA Resolution “Sustainable Mountain Development”. On 19 December 2019, during the plenary session, the UN General Assembly adopted the Resolution “Sustainable Mountain Development” ([A/RES/74/227](https://undocs.org/en/A/RES/74/227)) represented by

the Kyrgyz Republic and Italy. 80 UN Member-States cosponsored this Resolution. The Resolution stresses the special vulnerability of mountain ecosystems and people living in mountain environments and recommends adopting holistic approaches to the improvement of livelihood of the local mountain communities and the sustainable use of mountain resources. The Resolution also mentions initiatives by the UN Member-States to promote sustainable mountain development, such as the adoption of the initiative of the Kyrgyz Republic on the International Mountain Day in 2003 and International Year of Mountains in 2002, establishment of the Group of Friends of Mountainous Countries in August 2019 in New York, the International Snow Leopard and Ecosystem Forum in 2017, the third World Nomad Games in 2018 and the fourth World Mountain Forum in October 2018 in Bishkek.

Source: <https://undocs.org/en/A/RES/74/227>

International Mountain Day. December 11 is the International Mountain Day, which was introduced by resolution of the 57th UNGA session in 2003 to draw attention to the problems of mountains and the need to help mountain communities. FAO is the coordinating agency for the preparation and animation of this celebration and is mandated to lead observance of it at the global level. Since 2004, celebrations of this Day have been dedicated to a specific theme. In 2019, “[Mountains Matter for Youth](#)” was the theme of the International Mountain Day. International Mountain Day is a chance to highlight that for rural youth, living in the mountains can be hard. Many young people leave in search of a better life and employment. Migration from mountains leads to abandoned agriculture, land degradation and a loss of cultural values and ancient traditions. Education and training, market access, diverse employment opportunities and good public services can ensure a brighter future for young people in the mountains.

Mountain Partnership. The Mountain Partnership is a UN voluntary alliance of partners dedicated to improving the lives of mountain peoples and protecting mountain environments around the world. Founded in 2002, the Mountain Partnership addresses the challenges facing mountain regions by tapping the wealth and diversity of

resources, knowledge, information and expertise, from and between its members. The Partnership operates on a multi-stakeholder basis with active support from 381 members, including 60 governments, 16 intergovernmental organizations, 297 major groups, and 8 subnational authorities, and promotes sustainable mountain development in all three dimensions – economic social and environmental. The Mountain Partnership is supported by a Secretariat which is hosted by FAO in Rome.

Sources: www.mountainpartnership.org;
<http://www.fao.org/mountain-partnership/en/>

Group of Friends of Mountainous Countries. At the initiative of the Kyrgyz Republic in the framework of the UN, a Group of Friends of Mountainous Countries was established in New York in 2019. The Group includes 22 member countries: Afghanistan, Andorra, Albania, Armenia, Austria, Azerbaijan, Bangladesh, Bhutan, Bolivia, Canada, Georgia, Greece, Kyrgyzstan, Lebanon, Liechtenstein, Morocco, Nepal, Norway, Romania, Switzerland, Tajikistan, and Turkey. The first inaugural meeting of the Group took place on 29 August 2019.

Mountain Portal and Interactive Map of Mountain Communities. The Global Mountain Biodiversity Assessment platform provides the [Mountain Portal](#)⁸⁸, which explores biological richness of more than 1,000 mountain ranges worldwide. In 2018, the Mountain Partnership Secretariat launched the [Indigenous Peoples and Local Communities living in Mountain Areas Map](#)⁸⁹. This interactive map aims at raising awareness on indigenous and local mountain peoples by offering a visual representation of where they live and additional information pertaining to their food systems and cultural identities.

WMO convened the High Mountain Summit from 29 to 31 October 2019 at its headquarters in Geneva, Switzerland. The participants identified priority activities to support more sustainable development, disaster risk reduction and climate change adaptation in both high mountains and plains.

Source: <https://public.wmo.int/en/events/meetings/high-mountain-summit>

⁸⁸ www.mountainbiodiversity.org

⁸⁹ www.arcgis.com/apps/webappviewer/index.html?id=561ae08b8526458ab9711ca5011dadbd

12.6. Diagnostic Report on Rational Use of Water Resources in Central Asia as of 2019: Summary

In 2019, OECD, with the financial support from Germany, initiated the preparation of the “Diagnostic Report on Rational Use of Water Resources in Central Asia as of 2019”. The Diagnostic Report reviews the use and management of water resources in Central Asia over the period from 1998 to 2019. It, particularly, assesses changes in water and land use and management in Central Asia over the past 20 years; identifies future water challenges, development trends and needs for the long-term rational use of water resources and irrigated land; assesses the progress made with implementation of the “Fundamental Provisions of Water Management Strategy in the Aral Sea Basin”; prepares a data-

base of key information and indicators in support of the Diagnostic Report. The Diagnostic Report was prepared by SIC ICWC, with contributions from leading experts from the CA countries. In early 2020, the Report was updated based on the feedback from various agencies and organizations in CA countries. The authors consider the Diagnostic Report as a first step for preparation of a Regional Strategy for Rational and Efficient Water Use in Central Asia, the need for which was voiced by the President of Uzbekistan at the XII Summit of the Heads of IFAS Founder-States in Turkmenbashi in August 2018. The key findings and recommendations of the Report are presented below.

Socio-Economic Characteristics

The total population in Central Asia is 72.9 million as compared to 55.4 million in 2000 and 63.5 million in 2010 (2019). Demographic pressure has been lessened, and the **growth rate has stabilized** at 2% a year in all countries by 2019. An increase in external migration is the main cause of lower population growth. The share of rural population is still high in Central Asia: 56.2% in 2019 as compared to 64.4% in 2000.

Employment is not stable and is characterized, among other things, by a high percentage of temporary labor migration from Kyrgyzstan, Tajikistan and Uzbekistan. Remittances have become increasingly important in the region's economy, equivalent to 48% of GDP in Tajikistan (which was the highest coefficient globally), 31% in Kyrgyzstan, and about 5% in Uzbekistan in 2013. The share of economically active population employed in agriculture is still very high in the riparian countries of the Aral Sea basin.

Since 1991 to 2000, **economic indicators** in the CA countries showed a sharp drop; economies have started to grow since 2000 both by country as a whole and by key sector (industry, agriculture, energy). By 2019, economic development in all the countries, except for Tajikistan, exceeded the level that was in 1990.

Major changes took place in the structure of national income (GDP) in the countries of the Aral Sea basin since independence. The share of agriculture has dropped in national incomes of the riparian countries, particularly in Uzbekistan (by 26.8% in 2017 as compared to 1990) and Kazakhstan (by 12.6 pct). Concurrently, the share

of industry increased moderately in Uzbekistan (+4.0 pct) and in Kyrgyzstan (+4.4 pct), grew significantly in Kazakhstan (+45.5 pct) and dropped in Tajikistan (-33.8 pct). At the same time, the services sector has shown dramatic growth in all the countries of the Aral Sea basin. The comparative socio-economic and resource indicators of the Central Asian countries are provided in Tables below.

Water availability, land use and energy supply. The CA countries have relatively equal conditions in terms of unit water supply, except for Turkmenistan, which went far ahead, and Kyrgyzstan dramatically lagged behind. Similar situation is observed regarding irrigated land areas, given that Kazakhstan does not use about 1 Mha of land, which is equipped with irrigation network. As to energy supply, Kazakhstan and Turkmenistan are far ahead against relatively similar situation in other countries. Afghanistan well lags behind in all positions, including water, irrigated land and electricity.

Prospective strategic priorities of the CA countries development are based on natural and socio-economic characteristics of each country. There are also common development tendencies that, in the context of the water sector, can be formulated as follows: (1) enhancement of market relations and support of innovation-based entrepreneurship; (2) improvement of agricultural productivity and increase of crop processing, revival of cooperation and organization of clusters, achievement of food security; (3) development of hydropower and renewables; (4) widespread digitization; (5) regional security.

Table 10. Comparative indicators of the CA countries and Afghanistan (2018)

Country	Country area,	Irrigated area,	Population,	GDP,	Water resources formed within the country,	Total water withdrawal of the country,
	<i>Mha</i>	<i>thsd. ha</i>	<i>million</i>	<i>billion \$</i>	<i>km³</i>	<i>km³</i>
Kazakhstan	272.50	1,480.0	18.40	170.50	56.5	18.73
Kyrgyzstan	19.99	1,024.5	6.26	7.95	47.3	5.53
Tajikistan	14.23	760.0	9.13	7.52	64.0	12.31
Turkmenistan	48.81	1,553.1	5.85	40.76	1.4	25.38
Uzbekistan	44.90	4,302.6	33.26	50.50	12.4	50.95
Total in CA	400.42	9,120.2	72.89	277.23	181.6	112.89
Afghanistan	65.24	378.4*	8.20*	20.51	21.2*	3.50*

Note: * The data on irrigated area, population, water formation and water withdrawal of Afghanistan are shown for Northern Afghanistan only (Amu Darya, Harirud and Murghab River basins).

Source: "Water Resources Management in Afghanistan", presentation by Nasim Nuri at the International Economic Forum in Astana (2018).

Table 11. Specific indicators of water, land, and energy use in CA and Afghanistan, Mm³ (2018)

Country	Irrigated area per capita,	GDP per capita,	Water use per capita,	Water withdrawals for municipal water supply,	Electricity production per capita,
	<i>ha/pers</i>	<i>\$/pers</i>	<i>m³/pers</i>	<i>m³/pers</i>	<i>kWh/pers</i>
Kazakhstan	0.080	9,268.54	1,018.27	48.63	5,822.1
Kyrgyzstan	0.164	1,270.11	883.21	32.60	2,493.3
Tajikistan	0.083	823.97	1,348.79	83.27	2,158.5
Turkmenistan	0.265	6,966.64	4,337.77	95.43	3,623.4
Uzbekistan	0.129	1,518.47	1,531.99	86.30	1,888.4
Total in CA	0.140	3,969.54	1,824.01	69.25	3,197.1
Afghanistan	0.010	551.83	426*	–	26.3

Note: * The data on per capita water use in Afghanistan are shown for Northern Afghanistan only (Amu Darya, Harirud and Murghab River basins).

Source: The data of CA experts involved in the work on the Diagnostic Report and from the Regional Information System CAWater-IS.

Geopolitics and integration processes. Central Asia is a region at the crossroads of interests of the world's major powers for its high development potential, availability of natural and intellectual resources, and strategic location. Geopolitical influence of the region will depend on the degree of

unity of the region's countries, which has been strengthened in the last three years. Among the geopolitical and geo-economic factors that would have their effect on water use in CA are the restoration of peaceful life in Afghanistan and the Chinese Belt and Road Initiative (BRI).

Water Resources in Central Asia

Central Asia has several hydrological basins, the largest of them being the Aral Sea basin. There are number of interstate basins in Kazakhstan (Ural, Irtysh, Tobol, Yesil, Nura), Kyrgyz-

stan (Sary-Jaz, Issyk-Kul), as well as the Ily River and Chu-Talas basins in the territories of Kazakhstan and Kyrgyzstan. Besides, three interstate basins are located in the territory of Turkme-

nistan, the two of which belong to the Large Amu Darya basin – the Murgab and the Harirud (Tejen). The third basin of the Atrek River is small.

Assessment of surface water resources. The comparison of current assessments and the data for 2001 indicates to lowering of runoff by 0.51 km³ in the Amu Darya basin and by 0.9 km³ in the Syr Darya basin. Generally, there was a decrease in inflow in the region outside the Aral Sea basin: by 16.2 km³ in Kazakhstan, including by 12.1 km³ along transboundary Black Irtysh, Ili and Ural rivers because of increased water diversions in the upper reaches, particularly within the territories of China and Russia, while the natural inflow into the Irtysh River has slightly increased.

Groundwater. In the Aral Sea basin as a whole, the estimated regional usable groundwater stock – about 400 aquifers – has decreased by 2018 as compared to 1998, through deterioration of aquifer quality in some places. Annual abstractions from the approved resources have decreased by 25-30% in Uzbekistan only. Groundwater resources are maintained at the same level or even increased in other countries; however, water intake from groundwater decreased in all the countries.

Water Use and Flow Regulation

Since the 2000s, the total water withdrawal did not change considerably; although some changes were observed in water uses (see Table 12). In the region as a whole, water withdrawal for

Return water. According to SIC's data (regional database, PEER Project⁹⁰), in 2000-2017, 35.78 km³ of collector-drainage water and wastewater were generated in the Amu Darya and the Syr Darya basins. 15.26 km³ were generated in the Syr Darya basin and 20.51 km³ were formed in the Amu Darya basin. Over this period of time, on average 17.67 km³/year were discharged to rivers and 14.43 km³ – to lakes and natural depressions. As compared to 1990, the amount of return water decreased by 0.6 km³ (1.7%). However, the comparison with 1990-1999 [SPECA 2001 Diagnostic Report] shows that the amount of return water increased by 3.3 km³ (11%).

Climate change. Variability and intensity of precipitation increase in many areas in Central Asia, however, the river runoff did not undergo substantial transformations in this period of time. There is certain downward tendency for small rivers' runoff, whereas in large river basins a decrease in runoff was minor. At the same time, the frequency and amplitude of extreme floods and water shortages have increased sharply. This necessitates closer attention to multiyear runoff regulation.

drinking and household needs increased by 6.3% and that for industrial needs grew by 25.5%. However, in Turkmenistan and Uzbekistan water withdrawal for drinking and household needs

Table 12. Data on water withdrawal and water consumption in the Aral Sea basin
(comparison of 2002 and 2018)

Country	TOTAL*		Irrigation		Drinking and household needs		Industry		Energy	
	2002	2018	2002	2018	2002	2018	2002	2018	2002	2018
Kazakhstan	13,830	18,732	10,294	12,301	600	895	2,937	5,536	65,430	66,650
Kyrgyzstan	4,469	5,526	4,264	5,240	128	204	77	82	3,186	2,739
Tajikistan	12,691	12,301	9,623	10,215	619	760	392	348	n.a.	n.a.
Turkmenistan	28,334	25,380	24,990	22,385	623	558	1,700	1,523	2,860	n.a.
Uzbekistan	60,554	50,947	47,434	45,086	3,002	2,870	4,727	4,852	64	130
TOTAL	119,878	112,886	96,605	95,227	4,972	5,287	9,833	12,341		

Note: * Due to lack of accurate accounting of water withdrawal for energy sector, total water use is estimated excluding the energy sector. The year 2002 is chosen for comparison since 2000 and 2001 were extremely dry. Figures in the Table characterize water withdrawals at province boundaries.

Source: The data of CA experts involved in the work on the Diagnostic Report

⁹⁰ Transboundary Water Management Adaptation in the Amudarya Basin to Climate Change Uncertainties project was implemented by SIC ICWC in 2015-2018 with financial support from USAID

decreased. In Tajikistan and Turkmenistan water withdrawal for industrial needs also decreased. Over the 20-year period, irrigation water use virtually did not change in the region as a whole.

In the Aral Sea basin, the water withdrawal has decreased by 12 km³ from 119 km³/year right since independence due to the decline in all economic sectors. Over 2000-2018, water withdrawal averaged 106 km³, including 90.1 km³ for irrigation. In dry years, water withdrawal decreased to: 100.4 km³ (81.3 km³ for irrigation) in 2000 and 96.7 km³ (77.5 km³ for irrigation) in 2008. There was also a period of time (2002-2005), when water withdrawal increased to 111-121 km³/year.

Evaluation of losses. In Master Plans of water resources development and use for the Amu Darya and the Syr Darya, water losses are estima-

ted at 3.15 and 2.74 km³, respectively, or just about 6 km³. The current overestimation of total losses mentioned above results partially from errors in water accounting. Therefore, those cannot be considered as losses in full since a portion of water flows back in form of return water, i.e. roughly this amount of almost 15 km³ should be reduced by the average long-term value of return flow of 4.5-5 km³ a year. In any case, we should aim to cut those water losses through automation of waterworks facilities.

Drinking and household water supply. The actual average access of population to good quality water is: 62% in Kazakhstan; 45% in Kyrgyzstan; 65.7% in Tajikistan; 63% in Turkmenistan; and, 64.8% in Uzbekistan (Table 13). In all the countries, there is a situation in which households without centralized water supply incur higher costs per cubic meter of water.

Table 13. Drinking and household water supply in CA countries (2016)

Country	Access to water,	Actual average	Water losses,	Tariff,	Fee collection
	%*	l/day/capita**	%***	\$/m ³	rate, %**
Kazakhstan	62.0	220	30	0.10-0.58	85
Kyrgyzstan	45.0	140	50	0.07-0.11	65
Tajikistan	65.7	180	45	0,4-0.8	75
Turkmenistan	63.0	320	55	0.5	70
Uzbekistan	64.8	290	45	0.11-0.25	85

Note: *** Water losses include both technological (leakage in distribution networks and unavoidable losses) and commercial (unauthorized use, etc.) losses.

Source: * Data collected by national experts, ** Asian Water Development Outlook 2016: Strengthening water security in Asia and the Pacific. Mandaluyong City, Philippines: Asian Development Bank, 2016. (Asian Development Bank, 2016).

Irrigated farming remains the largest water consumer in the region and contributes largely to food security. By 2019, all the countries in the region but Afghanistan have achieved food security through changes in cropping patterns, sharply increased production of grain, fruits and vegetables, and reduction of cotton production. Irrigation norms in the Aral Sea basin were decreasing and amounted to the following values in 2017: 9,700 m³/ha in South Kazakhstan; 7,400 m³/ha in Kyrgyzstan; 13,300 m³/ha in Tajikistan⁹¹; 15,500 m³/ha in Turkmenistan; and 11,700 m³/ha in Uzbekistan. The last decade is notable for improved land productivity and new agri-business patterns aimed at the end product (clusters in Uzbekistan, Kyrgyzstan, cooperatives in Kazakhstan).

Industry. Within a short timeframe – about two decades – industrial production has grown 5.1 times in Kazakhstan, 4.1 times in Kyrgyzstan, 3.13 times in Tajikistan, 5.91 times in Turkmenistan and 6.12 times in Uzbekistan. It is characteristic that water intensity of the industrial sector is quite low in Kazakhstan and Turkmenistan (0.0448 m³ and 0.0438 m³ per 1\$ of output, respectively), highest in Uzbekistan (0.17 m³) and slightly lower in Tajikistan (0.07 m³).

Hydropower makes a substantial contribution to regional electricity production by providing one fifth of the total electricity production (21.8% in 2018) and the bulk of electric energy in Kyrgyzstan and Tajikistan. Given enormous hydropower potential (460 TWh/year in the region as a

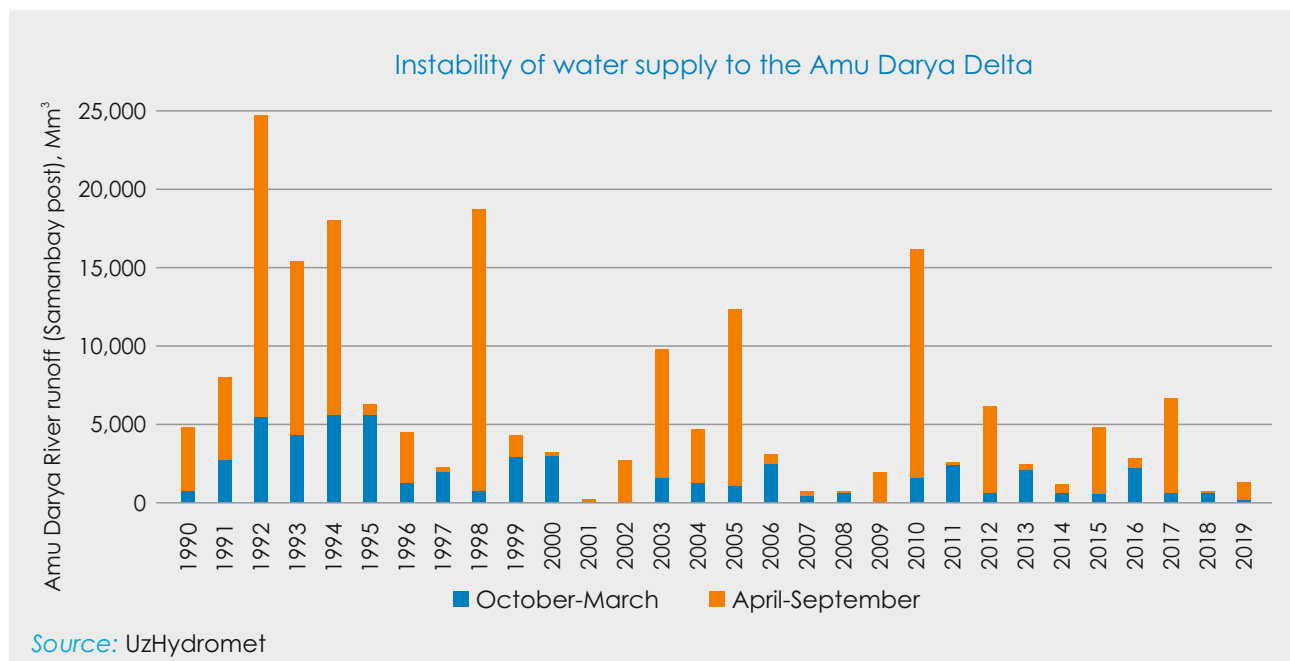
⁹¹ According to the Tajikistan's Agency for Land Reclamation and Irrigation, in 2017, the actual water withdrawal was 7.99 km³, i.e. the irrigation norm was 10.5 m³/ha

whole) and relatively cheap energy generated at HPPs, the region has seen an increase in hydropower development over the last 20 years. Since independence, a considerable increase in hydropower generation has been reached by Kyrgyzstan (Kambarata-2 at the Naryn River), Tajikistan (Sangtuda-1, Sangtuda-2, first two aggregates of Roghun project at the Vakhsh River), and Uzbekistan (Tupolang HPS) and reconstruction of Charvak HPS). It should be noted that maximal utilization of energy potential puts irrigation, drinking water and nature needs in jeopardy.

River flow regulation. The main hydroschemes of the Vakhsh and Naryn-Syrdarya reservoir cascades in the Amu Darya and the Syr Darya basins, operation of which was switched in the late 1990s from an integrated regime to energy generation or mixed regime, with the priority of energy generation in winter, continued operating in a modified regime in the past decade. The degree of flow regulation in the main rivers of Central Asia slightly increased through the

construction of new hydroschemes on the Vakhsh River and intra-system reservoirs for irrigation purposes on the Syr Darya River. At the same time, a decrease in the reservoir storage capacity was observed due to siltation (Nurek, Tuyamuyun, and Kayrakum reservoirs). Over the last 15 years, there has been a trend towards increased idle discharges from HPPs due to unreliable flow forecasts and the lack of inter-sectoral coordination of water releases regimes.

Environmental requirements of a river are comprised of water releases to its delta and inland water bodies, in-stream flow needs along the river and environmental water releases to some canals. Sanitary water releases along the rivers and environmental water releases to canals to keep continuous flow are basically maintained. Water supply to the Syr Darya and Ili River deltas is ensured. Water supply to the Amu Darya River delta is provided in needed volume in total over the decade; however, it is rather unstable between years and months. This results in periodic drying up of the delta's lakes (see the Figure below).



Environmental Matters Related to Water

Aral Sea and the Aral region. The Aral Sea has shrunk to less than 10% of its original volume and has divided into three water bodies: stable Northern Sea, deep Western body, and periodically drying up Eastern body. The Aral region's lakes, sustainable in the north and unstable in the south, maintain biopersistence in the area of the former Aral Sea. Stability of the Northern Sea and the adjacent Aral region is ensured through the stable inflow from the Syr Darya River and a

dam in the Berg Strait. As to the exposed seabed and the South Aral region in the territory of Uzbekistan, large-scale afforestation efforts are undertaken there, along with construction of a system of small lakes.

More than half of the land fund in Central Asia is prone to salinization to a greater or lesser degree. Given the total area of the Aral Sea basin of 155 Mha (excluding Afghanistan) and the avai-

lable drained land fund of 32.6 Mha, non-saline land area is 8.6 Mha and saline land area is 23.9 Mha. Although the irrigated land is well equipped with drainage, maintenance of the latter is unsatisfactory. Consequently, 20% of the land is in poor conditions, resulting in low fertility, and requires about 3 km³ of additional water for leaching.

The unit volume of drainage flow generated in the Amu Darya basin varies from 3,500 to 12,700 m³ per hectare. This volume ranges from 1,700 m³ to 8,300 m³ per hectare in the Syr Darya basin. Moreover, considering the average long-term period, 37% of drainage flow generated in the Amu Darya basin is discharged to the stem stream and re-used, 60% is discharged to closed lakes and only 3% is used for irrigation. The picture is different in the Syr Darya basin: 60% of drainage flow is discharged to the stem stream, 21% is discharged to depressions, and 19% is used for irrigation. The envisaged return (collector-drainage) water management that was to strictly limit water withdrawals and the discharge of salts and contaminants, based on dynamics of river salt and pollution balance, has failed.

Water quality. Most surface water bodies in Central Asia refer as moderately polluted. In the upper and middle reaches, the acceptable pollution limits are kept, while in the lower reaches the latter are exceeded by more than 50% in some periods of time. Water quality monitoring in most interstate rivers in Central Asia is performed by one of riparian countries only; the exception is the Karatag-Surkhandarya and the Chu-Talas rivers and the Amu Darya and the Syr Darya (main course). Rivers shared by Kazakhstan, Chi-

na and Russia are jointly monitored. The indicators of river water salinity for irrigation purposes are systematically estimated and monitored at the transboundary level by BWO Amu Darya and BWO Syr Darya. Water salinity is 0.47-0.58 g/l in upper reaches of the river, increases to 0.69-0.86 g/l in lower reaches close to Tuyamuyun point and exceeds 1.23 g/l at the Nukus city (Samanbai section). The data on salinity in the Syr Darya River indicate to further deterioration of water quality over the last 20 years. On the whole, national systems of water quality standardization in Central Asia contain all the required components to facilitate appropriate monitoring. However, their implementation faces difficulties due to the lack of technical and financial resources.

Upper catchment ecosystems and biodiversity in Central Asia are threatened due to population growth and economic development. Pastures suffer from overgrazing, with consequent deterioration of ecosystem quality. The use of forest timber for heating is another topical problem. Moreover, there is lack of consistent and reliable data on flow formation in highlands. Therefore, systems analysis of current biological resources, ecosystems and biodiversity is needed for highlands. The runoff formation areas are under risks of mudflows, avalanches, landslides and rock-dammed lake breaches. There is a need to assess the current state of snow cover and glaciers, analyze current and future climatic processes in highlands, and forecast glacial and snow cover areas. Uranium tailings storage sites represent another problem in the runoff formation area.

Water Management at National Level

Since gaining independence, almost in all CA countries, the **status of national water agencies has been revised down** from a separate ministry to a department or committee in the structure of different ministries. Since 2018, the countries have started to restore the institutional integrity of water management: Ministry of Water Management in Uzbekistan (2018), State Committee for Water Management in Turkmenistan (2019), and State Agency for Water Resources at the Kyrgyz Government (2019) were established. In 2013, the Ministry of Energy and Industry was re-organized into the Ministry of Energy and Water Resources of Tajikistan assigned with water policy-making and governance.

All the CA countries underwent **several stages of legal reforms** in water management and laid the foundation for implementation of integrated water resources management (IWRM). New water codes that embrace IWRM were adopted in Tajikistan (2000), Kazakhstan (2003), Turkmenistan (2004, 2016) and Kyrgyzstan (2005). Appropriate amendments were made in the Law on Water and Water Use in Uzbekistan (2013). However, the degree of implementation of IWRM in CA countries is still rather low. Two countries – Kazakhstan and Uzbekistan – provided the data on SDG indicator 6.5.1, which tracks the degree of IWRM implementation across four key components: enabling environment; institutions and participation; management instruments; and, financing⁹². Out

⁹² <http://iwrmdataportal.unepdhi.org/>, https://sdg6data.org/country-or-area/Kazakhstan#anchor_6.5.1

of the maximum score of 100, Kazakhstan collected 30 points (low degree), while Uzbekistan collected 45 points (medium-low).

The system of water governance at provincial/district level has undergone multiple changes, especially in water accounting and coordination between hierarchical levels. At the same time, implementation of IWRM (hydrographic principle, public participation, water conservation, and extension services) on an area of 130,000 ha of agricultural land gave an impetus for the improvement of intra-state management. The **lowest level of water management** (Water User Associations) has been remaining the weakest chain in water hierarchy of the CA countries for the last 15 years. As a way out of such situation, it is proposed to introduce me-

chanisms of public-private partnership to WUAs and establish the cluster-based system.

Irrigation service fees. Kazakhstan, Kyrgyzstan and Tajikistan apply water charges, which partially cover operation and maintenance (O&M) of hydraulic structures at basin (provincial) level. Water users in Kazakhstan, Kyrgyzstan and Tajikistan pay for irrigation services provided by both water-management organizations (WMO) and water user organizations (WUO). In Uzbekistan and Turkmenistan, water users pay for services provided by water user organizations only. Tariff rates for irrigation services differ, depending on service provider and country (Table 14). The collected irrigation service fees in the CA countries are not enough to cover O&M. Therefore, water charges are a weak incentive for better water management here.

Table 14. Tariff rates for irrigation services in Central Asia countries (2019)

Country	Service provider	Tariff	
		National currency	US\$*
Kazakhstan**	WMO	16.135 tenghe/m ³ (pumped irrigation)	4.15 cent/m ³
		29.5 tyin/m ³ (gravity irrigation)	0.074 cent/m ³
	APC	1,600-2,500 tenghe/ha	4.1-6.43 \$/ha
Kyrgyzstan	WMO (DWMA)	3 tiyin/m ³	0.043 cent/m ³
	WUA Union	4 tiyin/m ³	
	WUA	400-800 som/ha	6-11 \$/ha
Tajikistan	WMO	2*** diram/m ³	0.21 cent/m ³
	WUA	40-120 somoni/ha	4-12 \$/ha
Turkmenistan	PFU	3% of farm's yield	
Uzbekistan	WCA	25-50 thousand soum/ha	2.6-5.2 \$/ha

Notes: * Exchange rate: \$1=388.62 tenghe (Kazakhstan), \$1=70 som (Kyrgyzstan), \$1=9.52 somoni (Tajikistan), \$1=9,500 soum (Uzbekistan)

** In 2018, Kazakhstan established uniform tariff for all provinces. Earlier, tariffs differed by province. It is planned to raise irrigation service tariffs every year (until 31.07.2023). Here, tariffs are given on WMO (excluding VAT) for 01.08.2019 to 31.07.2020. Kazakhstan also practices tax on water as a resource besides payment for irrigation services.

*** Until 2018, the tariff was equal to 1.5 diram/m³

Source: Compiled by authors based on interviews and field visits (2019)

Human resources. Because of financial difficulties in the CA countries since gaining independence, water management organizations tended to reduce their staff, while ignoring existing staffing requirements. The water education and training system also needs to be improved cardinally. Graduates that search for work in the water sector often do not meet the requirements of employers: lack of basic knowledge, poor engineering training, lack of skills to design

water facilities, make assessment and analysis of problems and propose fully-fledged solutions on land reclamation and irrigated agriculture, taking into account current realities and prospective developments in the sector.

Research and design framework of water management. Substantial budget cuts for research resulted in lowering of research capacity. The majority of design institutes were also destruc-

ted because of the rules for participation in design work on the basis of Western system of tenders. At present, the task is set to rehabilitate this design and research capacity, build new laboratories, provide the institutes with equipment and high-qualified staff.

Development of information systems. Among the CA countries an online national water informa-

tion system (accessed by authorized users) exists in Kyrgyzstan only. Other countries plan to complete similar systems in the coming years. At the regional level with SDC's support, the Regional Information System on water and land resources in the Aral Sea Basin (CAWater-IS) has been developed and is maintained by SIC ICWC.

Water Management at Interstate Level

The legal framework of transboundary water cooperation in the Aral Sea basin has largely followed water management practices of the Soviet period and **needs to be updated** to account for changing needs and interests. Repeated attempts to improve the existing legal framework have failed because of countries' unwillingness to make mutual concessions.

Joint bodies, first of all, ICWC had an invaluable role in establishing and maintaining transboundary water cooperation in all major river basins of Central Asia. However, all IFAS bodies need institutional, technical and financial strengthening. ICWC was successful in operational water allocation and joint annual planning of water distribution, but did not pay sufficient attention to long-term development and future water availability. Among the key bottlenecks of ICWC activity are the unresolved political, economic, institutional, legal and financial aspects of water use

in the region. Also, it is necessary to establish more effective interactions within the IFAS system.

International assistance and Aral Sea Basin Programs. Since 1991 to 2019, different international partners provided assistance to the countries on water and related issues, focusing on institutional reformation, infrastructural, capacity building, research, and policy dialogue projects. Despite significant positive impacts of implemented projects, one should note the duplication of efforts and the lack of focus on action effectiveness from both the side of donors and national agencies. It was expected that the Aral Sea Basin Programs (ASBP) developed jointly by countries and international partners would determine the overall focus of regional projects but it has not always been possible to achieve this in practice. In spite of numerous statements by country representatives and international partners, the issue related to coordination of donors and their aid is still relevant.

Performance Review of Water Management System in the Aral Sea Basin

The water-management system in the Aral Sea basin is comprised of a quite complex set of water hierarchical levels (basin, sub-basin, national intake points, main and distributary canals, WUAs, water users), sectors and their structures and water consumers, as well as controlling systems. Sustainable water security is based on a coherent system of water management at all levels. For effective functioning of the upper (interstate and main-canal) level, it is necessary **to address the following shortcomings:** inaccuracy of annual flow forecasts and absence of long-term forecasts; deviations from the agreed water distribution plans; poor water accounting; idle discharges; lack of harmonization between energy water releases and irrigation needs. **Those, in combination with poor management at the lowest level, result in the coefficient of available water supply of 80% on average, given the water use efficiency of 50-52%.**

Water use sectors take different positions in terms of financial and institutional sustainability. Hydropower and industry are institutionally and financially stronger. Those sectors are in the focus of state agencies that provide financing for re-equipping, reconstruction and maintenance of advanced technical level, which allows for quick and maximal return on investments. They also have the lowest internal water losses and highest charges. Well worse situation is in irrigated agriculture and the household sector, where losses prevail, water charges are not sufficient, and state support through long-term loaning is well lower. There is big difference in irrigation water charges: from 0.043 cent/m³ in Kyrgyzstan and 0.21 cent/m³ in Tajikistan to 4.6 cent/m³ in Kazakhstan under pumped irrigation (Table 14).

Table 15. Characteristics of water-user sectors

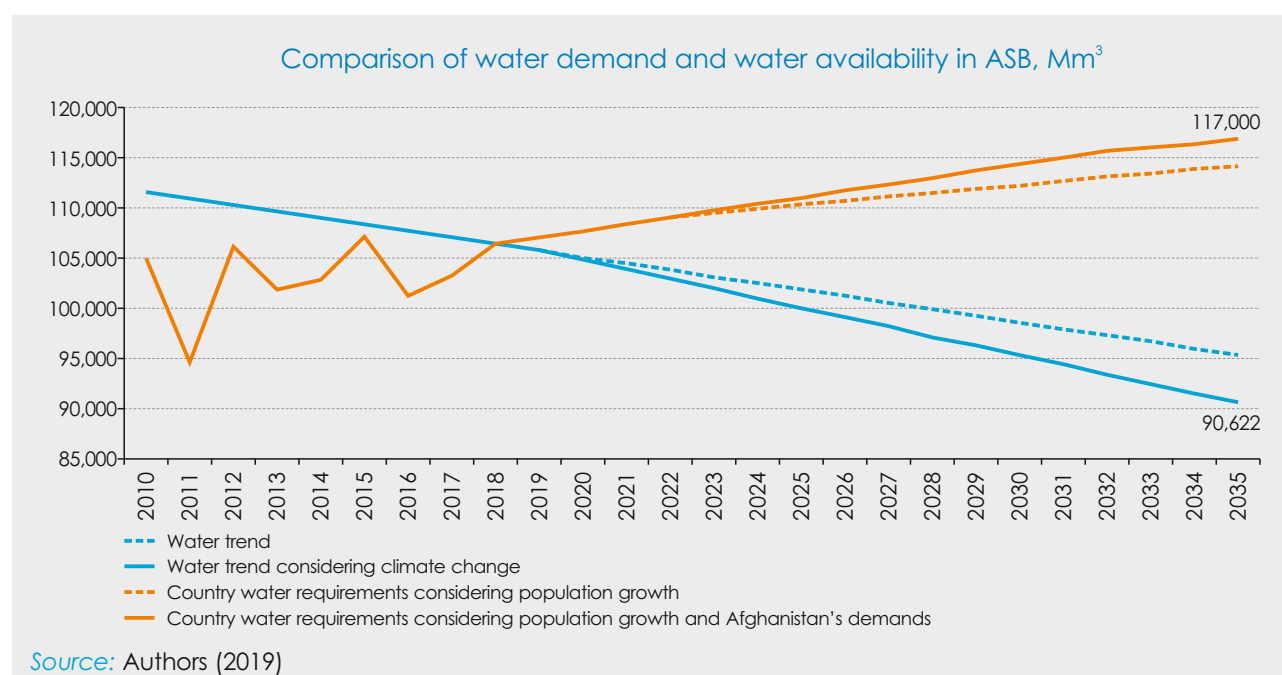
	Key water users					
	Hydropower	Irrigated agriculture	Household sector	Industry	Fishery	Nature
Institutional form	Joint stock company	Farms, clusters	Water utility		Farms	State environmental agency
WMO (water suppliers)	HPP authorities	BO, water-management organizations, WUA	Water utility	Water utility		
Use, % of total water withdrawal	0-80	15-95	1-8	1-6.5	0.1-0.2	7-20
Internal losses, %	3-10	30-65	30-55	Up to 20		
Water productivity, cent/m ³	0.8-40 cent/m ³	6-12 cent/m ³		1.4-12 \$/m ³		
Water charges paid from budget, cent/m ³		0.66-1.1	0.5-0.9	0.013-0.20		
Water charges paid by users	0.7-4.6 cent/m ³	0.043-4.6 cent/m ³	0.012-0.14 cent/m ³	0.4-0.8 \$/m ³		

Source: Authors (2019)

Future Water Outlook of Central Asia

Threats of climate change. By 2045, water resources are assumed to be increased in the Irtysh, Ili, and Ural basins because of climate change impact. By 2045 in the Aral Sea basin, in a maximum option it is assumed that climate change impacts are limited by 3-4 km³ of water a year in the Amu Darya basin and 2 km³ in the Syr Darya

basin (other options give 2.5 km³ and 0 km³, respectively). In the Amu Darya basin, climate will have higher impact on river runoff in June-July: the runoff would decrease to 0.8 km³ in August, 1.3 km³ in June and 2.7 km³ in July by 2055. This could add pressure on irrigation water supply. A certain positive effect of climate change found



in SIC's research in form of increased thermal resources and reduction of crop growing period should be taken into account. This would allow extending double-season crop production and reducing (!) water requirements. Given the crop varieties and soil-climatic conditions in highlands of Tajikistan and Kyrgyzstan, special studies are needed for these countries.

Key factors of water demand growth in the Aral Sea Basin. In the future, the major factors of water demand growth will be demographic growth, industrial production growth, increase in technological inputs for flow regulation, and increase in demand by Afghanistan. The future of regional water supply by 2040-2045 causes serious concerns. In the near future we will lack 17.3 km³ or 20 km³ of water a year for direct use in the Aral Sea basin relative to normal year. For dry years, similar to 2008, water deficit would exceed as much as 25-40 km³!

Recommendations for the Future: Measures for Sustainable Water Security in Central Asia

The analysis of implementation of "Fundamental Provisions of Water Management Strategy in the Aral Sea Basin" of 1998 shows that by present many actions proposed in 1998 are still relevant. Those include: (1) a set of measures for the reduction of unproductive water losses, (2) regional program for water conservation, (3) development and implementation of a mechanism for economic water relations, and (4) maintenance of systematic hydro-ecological monitoring in the Aral Sea region. In this context, more concrete and effective actions are needed to achieve progress.

To ensure sustainable water security in CA and achievement of SDGs by countries, **a set of measures for water management is required at all levels of water hierarchy**. Those include: improvement of water management at all levels; improvement of water accounting and forecasts and SCADA system at hydraulic structures; water conservation – a key priority at all levels; all-round application of satellite images for better water management; revision of irrigation norms and schedules; coverage of energy deficit and address of idle discharges; covera-

Potential of decreased river runoff in the Irtysh and Ili basins in the future. By 2045, there will be enough water to cover water needs in the Irtysh and Ili River basins, even given the possible extensive water withdrawal by China. Water management in the Irtysh basin could be challenged by the fall of Zaysan Lake level; separation of Bukhtarma reservoir from lake Zaysan, with reduced regulatory capacity; deterioration in fisheries, environmental conditions in the basin and flooding flood plain; significant reduction in electricity generation at Irtysh HPP cascade; deterioration in navigation along the Irtysh River on the territories of Kazakhstan and Russia (Omsk oblast'). Major complexities in water management in the Ili basin will be related to maintenance of water level in Lake Balkhash and protection of deltaic ecosystems in the river's lower reaches.

ge of irrigation water deficit through multiyear regulation; development of measures for adaptation to climate change; development of economic measures; human resources development and raising of public awareness; revival and enhancement of water research and design; and mobilization of additional water sources.

The need for the **enhancement of regional water cooperation** must be emphasized. Here, the focus should be placed on increased intersectoral coordination, improved accountability for fulfillment of decisions made, strengthening of regional organizations in key focus areas, such as water conservation, climate change, financial and economic mechanisms, as well as the establishment of an independent multidisciplinary expert platform for management decision support.

Source: OECD/SIC-ICWC, 2020. Overview of the Use and Management of Water Resources in Central Asia. A Discussion Document. Available online: https://issuu.com/oecd.publishing/docs/final_report_eng_issuu





Section 13

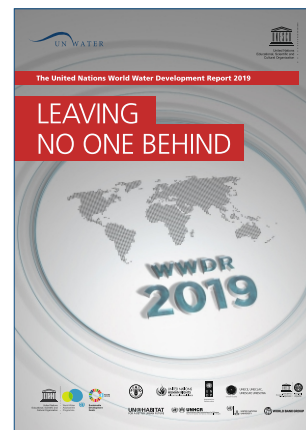
Publications in 2019

UN World Water Development Report 2019: Leaving no one behind

Published by: UN Water

URL: <https://www.unwater.org/publications/world-water-development-report-2019/>

The Report demonstrates how improvements in water resources management and access to water supply and sanitation services are essential to addressing various social and economic inequities. Fulfillment of the human rights to water and sanitation requires that the services be available, physically accessible, equitably affordable, safe and culturally acceptable. 'Leaving no one behind' is at the heart of the commitment of the 2030 Agenda, which aims to allow all people in all countries to benefit from socio-economic development and to achieve the full realization of human rights.

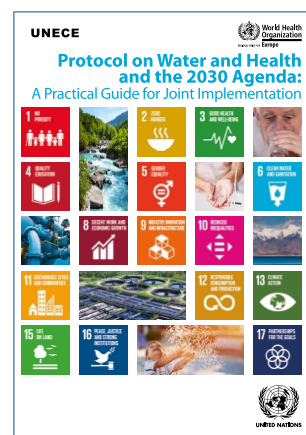


Protocol on Water and Health and the 2030 Agenda: A Practical Guide for Joint Implementation

Published by: UNECE, WHO

URL: <http://www.unece.org/environmental-policy/conventions/water/envwaterpublicationspub/water/brochures-about-the-protocol-on-water-and-health/2019/protocol-on-water-and-health-and-the-2030-agenda-a-practical-guide-for-joint-implementation/doc.html>

The Practical Guide for Joint Implementation provides step-by-step guidance on how to identify, establish and operationalize the links between the Protocol and the 2030 Agenda.

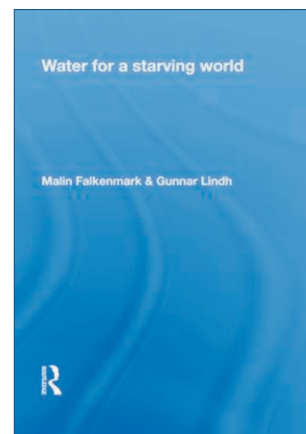


Water for a Starving World

Authors: Malin Falkenmark, Gunnar Lindh

URL: <https://www.taylorfrancis.com/books/9780429267260>

This book describes the role of water in development and illustrates water problems in different parts of the world with particular emphasis on the problems of the starving continents. It shows what tools will be needed and what can be done to bring the world's water under human control.

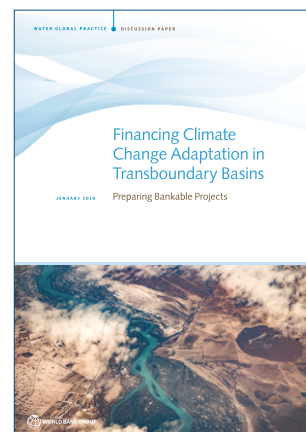


Financing Climate Change Adaptation in Transboundary Basins: Preparing Bankable Projects

Published by: UNECE, WB

URL: <http://www.unece.org/index.php?id=51488>

This report highlights the challenges and opportunities that countries face when seeking to access financial resources for climate adaptation in a transboundary river basin context. The paper explains how resilience building and taking a basin-level approach may allow countries and river basin organizations to use resources effectively for the greatest possible benefit. It outlines basic characteristics and criteria for the preparation of bankable project proposals.

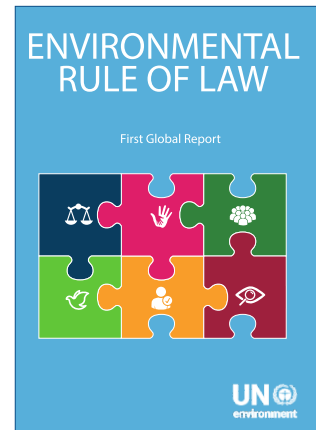


Environmental Rule of Law. First Global Report

Published by: UNEP

URL: <https://www.unenvironment.org/resources/assessment/environmental-rule-law-first-global-report>

The Report meets five objectives: (1) explore the meaning and importance of environmental rule of law; (2) highlight trends in environmental rule of law; (3) illustrate specific approaches that have strengthened environmental rule of law; (4) provide a benchmark against which to assess future developments; and (5) identify measures that countries can take to further strengthen environmental rule of law.

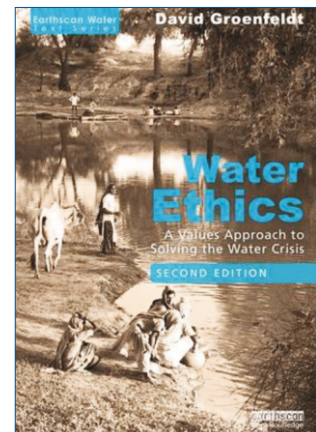


Water Ethics: A Values Approach to Solving the Water Crisis

Author: David Groenfeldt

URL: <https://www.taylorfrancis.com/books/9781351200196>

The book introduces the idea that ethics are an intrinsic dimension of any water policy, program, or practice, and that understanding what ethics are being acted out in water policies is fundamental to an understanding of water resource management.



Facing the Challenges of Water Governance

Editors: Simon Porcher, Stéphane Saussier

URL: <https://www.springer.com/gp/book/9783319985145>

Drawing together empirical studies from countries around the world, the editors and contributors combine extensive data to review the individual challenges facing each country, from the supervision of autonomous regulatory bodies to the question of centralization and the influence of local utility companies.

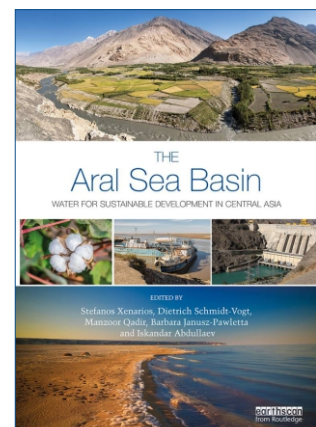


The Aral Sea Basin: Water for Sustainable Development in Central Asia

Authors: Stefanos Xenarios, Dietrich Schmidt-Vogt, Manzoor Qadir, Barbara Janusz-Pawletta, Iskandar Abdullaev

URL: <https://www.routledge.com/The-Aral-Sea-Basin-Water-for-Sustainable-Development-in-Central-Asia/Xenarios-Schmidt-Vogt-Qadir-Janusz-Pawletta-Abdullaev-Smakhtin/p/book/9781138348882>

This book offers the first multidisciplinary overview of water resources issues and management in the Aral Sea Basin, covering both the Amu Darya and Syr Darya River Basins. This book critically examines the current state, trends and future of water resources management and development in this major part of the Central Asia region.



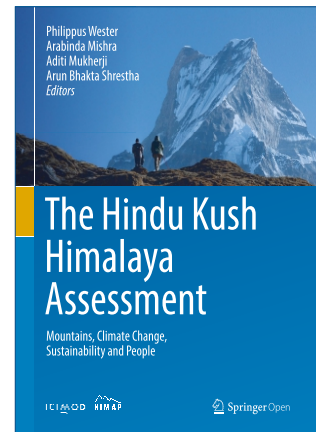
The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People

Editors: Ph.Wester, A.Mishra, A.Mukherji, A.Bh.Shrestha

Published by: Springer

URL: <https://doi.org/10.1007/978-3-319-92288-1>

It is the first comprehensive assessment of the Hindu Kush Himalaya (HKH) region providing: overviews: HKH drivers of change; climate change; future scenarios; sustaining HKH biodiversity and ecosystem services; meeting future energy needs in the HKH; status and change in the cryosphere; water availability and use; food and nutrition security; disaster risk reduction and increasing resilience; mountain poverty, vulnerability and livelihoods; adaptation strategies; gender and inclusive development; migration; governance and institutions.

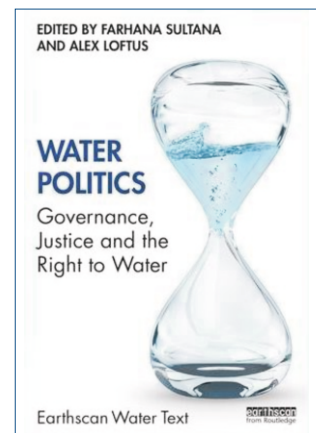


Water Politics: Governance, Justice and the Right to Water

Editors: Farhana Sultana, Alex Loftus

URL: <https://www.taylorfrancis.com/books/e/9780429453571>

The book shows how both discourses and struggles around the right to water have opened new perspectives, and possibilities in water governance, fostering new collective and moral claims for water justice, while effecting changes in laws and policies around the world.

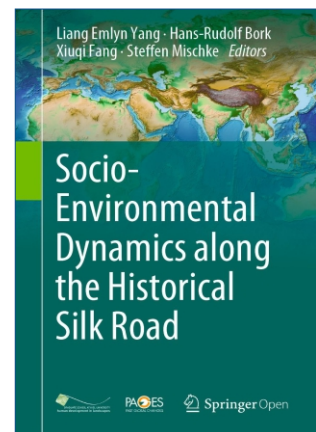


Socio-Environmental Dynamics along the Historical Silk Road

Editors: L. Yang, H.-R. Bork, X. Fang, S. Mischke

URL: <https://www.springer.com/gp/book/9783030007270>

The book introduces, by literature reviews, the issue of the links and processes behind climate change, environmental change, and socio-culture change in the past at the ancient Silk Road region. Studies indicate both that climate conditions significantly influence human socio-cultural systems and that the socio-culture systems are certainly resilient to climate impacts.

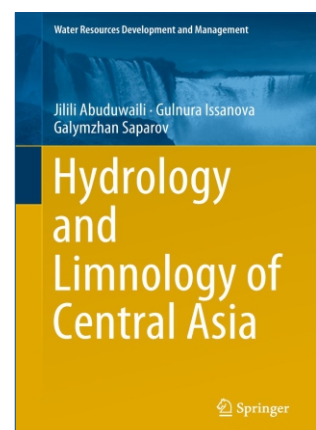


Hydrology and Limnology of Central Asia

Authors: Jilili Abuduwaali, Gulnura Issanova, Galymzhan Saparov

URL: <https://www.springer.com/gp/book/9789811309281>

This book highlights the development of lake systems and water reservoirs as well as the impact of climate change on water resources in Central Asian countries. It provides information on the genesis of lake basins, physical and chemical properties of water in lakes, and the hydrological regimes (water balance and fluctuation levels) of lakes of Central Asia and Xinjiang.



Pipe dreams: Water and Empire in Central Asia's Aral Sea Basin

Author: Maya Peterson

URL: <http://www.water-alternatives.org/index.php/boh/item/60-pipe>

The book stands as an indispensable exploration of the social and environmental change in Central Asia that has led to the disappearance of the Aral Sea. Peterson traces the roots of this ecological tragedy from tsarist modernizing visions and imperial incursions of the mid-1800s to the Bolshevik revolution of 1917 and onward through Stalin's grand projects that transformed the region. Drawing on vast archival research and sources across Central Asia and Russia, Peterson succeeds in forging a rich, authoritative narrative from the perspectives of Russians, indigenous peoples of Turkestan, and foreigners present at the time.

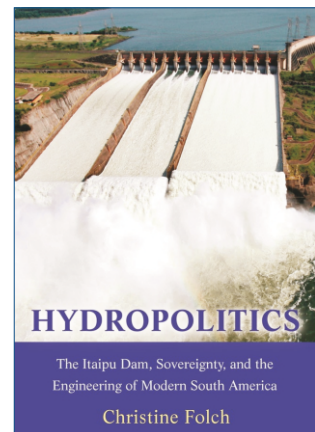


The Itaipú Dam, Sovereignty, and the Engineering of Modern South America

Author: Christine Folch

URL: <http://www.water-alternatives.org/index.php/boh/item/79-itaipu>

Based on in-depth, ethnographic fieldwork conducted from 2007 to 2010 (with follow-up visits in 2013, 2016 and 2017), this well-researched book traces the complex 'hydropolitics' of the Itaipú dam, the binational giant that straddles the Parana River and is co-owned by the Paraguayan and Brazilian public utilities, ANDE and Eletrobras.

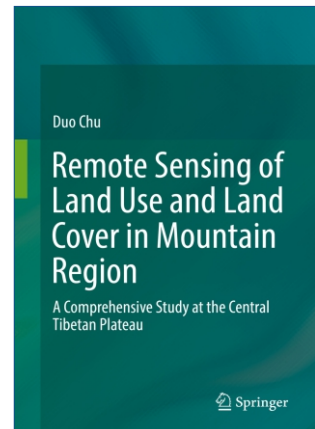


Remote Sensing of Land Use and Land Cover in Mountain Region: A Comprehensive Study at the Central Tibetan Plateau

Author: Duo Chu

URL: <http://www.springer.com/gp/book/9789811375798>

This book presents the spatial and temporal dynamics of land use and land cover in the central Tibetan Plateau during the last two decades, based on various types of satellite data, long-term field investigation and GIS techniques. Further, it demonstrates how remote sensing can be used to map and characterize land use, land cover and their dynamic processes in mountainous regions, and to monitor and model relevant biophysical parameters.

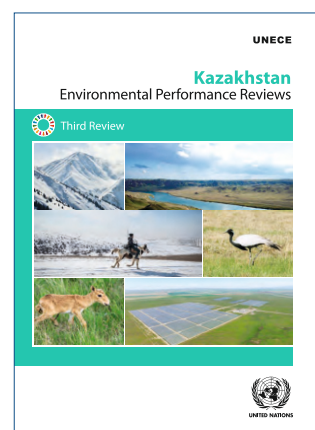


3rd Environmental Performance Review of Kazakhstan

Published by: UNECE

URL: <http://www.unece.org/index.php?id=51819&L=0>

The present publication contains the third Environmental Performance Review of Kazakhstan. The report takes stock of progress made by the country in the management of its environment since 2008. It covers legal and policy frameworks, greening the economy, environmental monitoring, and public participation and education for sustainable development.



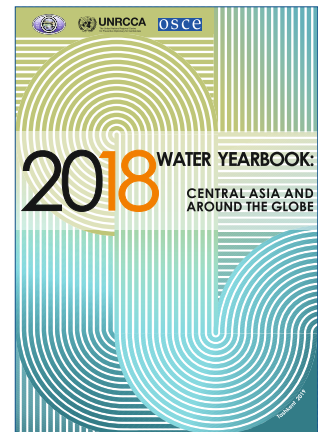
2018 Water Yearbook: Central Asia and Around the Globe (in English and Russian)

Editors: V.A.Dukhovniy, D.R. Ziganshina

Published by: SIC ICWC with support of UNRCCA and OSCE

URL: http://cawater-info.net/yearbook/pdf/yearbook2018_en.pdf

The Yearbook covers key water-related developments and events in 2018 that can be of interest for ICWC and all concerned parties.



Science and Innovations for Water Security, Issues 1&2 (in Russian)

Published by: SIC ICWC

URL: http://cawater-info.net/library/rus/eecca_papers_collection_vol_13_2019.pdf

http://cawater-info.net/library/rus/eecca_papers_collection_vol_14_2019.pdf

The collection of scientific papers by EECCA NWO reflects the current state of research and innovations in water sectors of EECCA countries.



Selected Treaties on Transboundary Waters Signed in Europe and Asia (1992-2019) (in Russian)

Published by: SIC ICWC

URL: <http://cawater-info.net/library/rus/eecca-law-2019.pdf>

This collection includes treaties concluded since 1992.



UN General Assembly Resolutions on Water Initiated by Central Asian Countries (in Russian)

Published by: SIC ICWC

URL: http://www.cawater-info.net/library/rus/un_resolutions_water.pdf

The collection includes UN General Assembly resolutions dedicated to important regional initiatives, such as the declaration of the International Year of Freshwater and the International Decades "Water for Life" and "Water for Sustainable Development", and to cooperation between the International Fund for Saving the Aral Sea and the United Nations.



“SIC ICWC Legal Collections” Series (in Russian)

Published by: SIC ICWC

URL: <http://cawater-info.net/library/legal3.htm>

Published:

- Improvement of the Public Water and Land Administration System in the Kyrgyz Republic (Issue 50);
- Transboundary Water Cooperation between Finland and Russia, Sweden and Norway (Issue 49);
- Improvement of the Public Administration System in Agriculture of the Republic of Uzbekistan (Issue 48);
- Improvement of the Public Administration System in the Water Sector of the Republic of Uzbekistan (Issue 47).



Water Resources: Conflict or Cooperation? (in Russian)

Published by: SIC ICWC

URL: http://www.cawater-info.net/library/rus/water_conflicts.pdf

The collection consists of two parts. The first part provides case studies of water tensions between and within countries. The second part presents case studies of cooperation in world's basins that continues despite current hydrological, political or technical difficulties.



Central Asia, Geopolitics and Water - What the Future Holds (in Russian)

Published by: SIC ICWC

URL: <http://cawater-info.net/library/rus/inf/53.pdf>

The collection contains the papers dedicated to the role and place of Central Asia in the world geopolitics. The foreign policies of Russia, U.S., China, EU, Turkey, Iran, Pakistan, and India are still among the major factors influencing processes taking place in Central Asia.



Handbook on Water Resource Management in Uzbekistan (in Russian)

Author: V.I.Sokolov

Published by: GIZ Office Tashkent

URL: http://waterca.org/wp-content/uploads/2019/11/Handbook_WRM_Sokolov_RUS.pdf

This Handbook provides an overview of integrated water resources management in Uzbekistan.



25 Year-Long Service of the International Fund for Saving the Aral Sea and New Impetus for Development in the Aral Sea Region (in Russian)

Published by: GEF Agency of IFAS

URL: <https://aral.uz/doc/25ifas.pdf>

This brochure gives an overview of activities of the International Fund for Saving the Aral Sea over 25 years since its establishment.



XV International Scientific-Practical Symposium and Exhibition "2019 Clean Water of Russia" (in Russian)

Published by: RosNIIVKh

URL: <https://wrm.ru/files/chvr2019.pdf>

The proceedings of the XV International Scientific and Practical Symposium "Clean Water of Russia-2019" includes paper on matters related to water security as a factor of sustainable development, namely:

- Water security in the context of growing water scarcity;
- Assessment of the status of water bodies and their restoration;
- Water quality management;
- Prevention of water hazards and safety of hydraulic facilities;
- Provision of population with good quality drinking water;
- The role of science and education in the safe living environment.

The collection also includes the theses of projects submitted to the International Research Contest of Young Scientists and Students "Water Security: Society, Technology, and Research".







Section 14

Central Asia Awards
in Water-related fields

President of Kazakhstan presented state awards on the Independence Day in Kazakhstan

On the eve of the Independence Day in Kazakhstan, **President K-Zh. Tokayev** presented state awards to prominent representatives of the industrial sector, business, education, healthcare, military personnel, law enforcement officers, athletes, war and labor veterans, cultural and scientific figures. **Nariman Kipshakbaev**, Academician of the National Academy of Sciences, Director of the Kazakh branch of SIC ICWC, was awarded the **Order of Barys, II degree**.

By the Decree of the President of Kazakhstan “On awarding the Al-Farabi State Prize of the Republic of Kazakhstan in the field of science and technology in 2019”, a group of scientists was awarded for the **scientific work on sustainable water supply of the natural and economic systems of the Republic of Kazakhstan in the context of national security**:

Medeu Akhmetkal – Director of the Institute of Geography, Doctor of Geographical Sciences, Professor, Academician of the National Academy of Sciences of the Republic of Kazakhstan, Academician of the Kazakhstan National Academy of Natural Sciences;

Alimkulov Sayat Kurbanbaevich – Deputy Director for Science, Institute of Geography, candidate of geographical sciences;

Malkovsky Igor Mikhailovich – Chief research associate of the Institute of Geography, doctor of geographical sciences, candidate of technical sciences, Professor;

Seversky Igor Vasilievich – Chief scientific associate of the Institute of Geography, doctor of geographical sciences, Professor, Academician of the National Academy of Sciences of the Republic of Kazakhstan;

Toleubaeva Lidia Sergazievna – Head of the Laboratory of Water Supply of Natural-Economic Systems and Mathematical Modeling, Institute of Geography, doctor of geographical sciences;

Tursunova Aisulu Alashevna – Head of the Laboratory of Assessment of Water Recourses, Institute of Geography, candidate of geographical sciences.



Sources (in Russian): <https://ru.sputniknews.kz/society/20191212/12277894/gosnagrady-tokayev-akorda.html>, https://www.akorda.kz/ru/legal_acts/decrees/o-prisuzhdenii-gosudarstvennoi-premii-respubliki-kazahstan-2019-goda-v-oblasti-nauki-i-tehniki-imeni-al-farabi

The Executive Directorate of IFAS in Kazakhstan awarded the medal “For Contribution to Saving the Aral Sea” to:

Baidjanov Guyzgeldi Nazargeldiyevich – Chairman of EC-IFAS;

Akmuradov Makhtumkuli Kiyasovich – Ministry of Foreign Affairs of Turkmenistan.

Ceremony of conferring state awards to builders in Tajikistan

The President of the Republic of Tajikistan Emomali Rakhmon issued an executive order “On awarding the builders of the Roghun Hydropower Plant” for their fruitful activity and great contribution towards the construction of the plant. The awards included the **Order of Sharaf (Order of Glory), II degree, Medal of Khizmati Shoista (For Distinguished Service) and diplomas of the Republic of Tajikistan.**

Source: <http://www.president.tj/en/node/21262>

Awards in agricultural and environmental sectors of Turkmenistan

By the decree of the President of Turkmenistan “On state awards and honorary titles in commemoration of the 28th Anniversary of Independence of Turkmenistan” (September 25, 2019), a number of employees of the Ministry of Agriculture and Environment Protection of Turkmenistan, State Committee for Water Resources of Turkmenistan and the Ministry of Energy of Turkmenistan were awarded the **medals of Turkmenistan “Watana bolan söýgüsi üçin” and “Gaýrat”** for many years of conscientious work, high performance and professional skills. The **Honorary title “Honored Worker of Agriculture of Turkmenistan”** was awarded to Khemraev Khudaynazar Khaytyevich, the tenant of Makhtumkuli Daihan association in Dovletli etrap of Lebap province.

Source (in Russian): <http://www.parahat.info/edict/1790>

President of Uzbekistan confers state awards to representatives of international organizations

On August 29, **President Sh.M. Mirziyoev** signed decrees on awarding several foreign citizens. The UN Resident Coordinator in Uzbekistan **Helena Fraser** and the OSCE Project Coordinator in Uzbekistan John McGregor were awarded the **Order of Dustlik.**

Source (in Russian): www.gazeta.uz/ru/2019/08/30/awards/

Awards on the occasion of the 28th Anniversary of Independence in Uzbekistan

By the decree of the President of Uzbekistan on the occasion of the 28th Anniversary of Republican Independence, state officials and employees of industrial and socio-economic spheres were awarded orders and medals:

Order “El-Yurt Hurmati” (“Respected by people and homeland”)

Mirzakulov Ummatkul Mamatkulovich – Director General of the State National Nature Park “Ugom-Chotkol”, Tashkent province;

Order “Fidokorona khizmatlar uchun” (“For selfless service”)

Asadov Fayzullo Burikulovich – Director of unitary enterprise “To'palang HPD Building” in Surkhandarya province;

Order “Mekhnat shukhrati” (“Labor Glory”)

Vakhabov Abrol Jabarovich – Adviser to the Prime Minister on Development of Agricultural and Food Spheres;

Order “Dustlik” (Friendship)

Abdullaev Abdushukur Khamidovich – Chairman of the State Committee on Land Resources, Geodesy, Cartography and State Cadastre;

Islamov Bobir Farkhadovich – Chairman of the State Committee on Geology and Mineral Resources;

Khodjametov Sabir Djabbarberganovich – Deputy Chairman of the Council of Ministers of the Republic of Karakalpakstan for Agriculture and Water Management;

Medal “Sodiq xizmatlari uchun” (“Faithful Service”)

Istamov Sadullo – Deputy Mayor for Agriculture and Water Management of Navoiy province;

Umarov Khalimjon Komilovich – Deputy Mayor for Agriculture and Water Management of Fergana province;

Khikmatov Sanatillo Nusratovich – Deputy Mayor for Agriculture and Water Management of Bukhara province.

The full list of awardees is available on:

<https://uza.uz/ru/documents/o-nagrazhdenii-v-svyazi-s-dvadtsativosmiletiem-nezavisimosti-30-08-2019> (in Russian).





Section 15

Global Risks 2020

"This year's report highlights important threads across the global risk landscape. Intensifying confrontations, both between and within countries, as well as a heightened sense of urgency and emergency around some critical global problems"

John Drzik, Chairman, Marsh & McLennan Insights

The emerging risks landscape

Geopolitical Instability

National politics in many countries has evidenced intense divisiveness and 'pushbacks', coupled with increasingly fractious international relations. These volatilities will likely persist, challenging cooperation on key priorities.

Economic Concerns

As economic confrontations between major powers grow, the global economy shows greater signs of a concerted slowdown.

Climate Response Shortcomings

Weak international agreements belie rising investor and popular pressure for action, against a backdrop of a multitude of natural catastrophes and indicators of longer-term disruptions. 2020 is a critical year for nations to accelerate progress towards major emissions reductions and boosting adaption investments.

For the future of climate change mitigation, 2020 is a critical year: it presents the first opportunity for nations to revise their national plans to tackle climate change as set out under the 2015 Paris Climate Agreement, and to close the gap between what they have pledged and what is needed.

An increasing number of governments are announcing long-term net-zero emissions goals and showing more interest in tackling outstanding challenges in developing potential low carbon solutions.

To avoid the worst consequences, global emissions need to peak almost immediately and decline precipitously – by 7.6% each year

[The Global Risks Report](#), published by the World Economic Forum with support from Marsh & McLennan, provides a rich perspective on the major threats that may impact global prosperity in 2020 and over the next decade. The 15th edition of the report draws on feedback from nearly 800 global experts and decision-makers who were asked to rank their concerns in terms of likelihood and impact.

between 2020 and 2030. This implies an additional US \$460 billion a year of clean energy investment over the next decade.

Food and water crises

Crop yields will likely drop in many regions, undermining the ability to double food production by 2050 to meet rising demand. Because agriculture, livestock and deforestation produce nearly a quarter of global emissions, more efficient use of land is critical; it's also one of the best potential carbon sequestration options. Water scarcity will increase as well – it already affects a quarter of the world's population.

Biodiversity Loss Impacts

Many ecosystems are in decline or at risk of distinction. Biodiversity loss poses irreversible consequences to societies, economies, and the health of the planet.

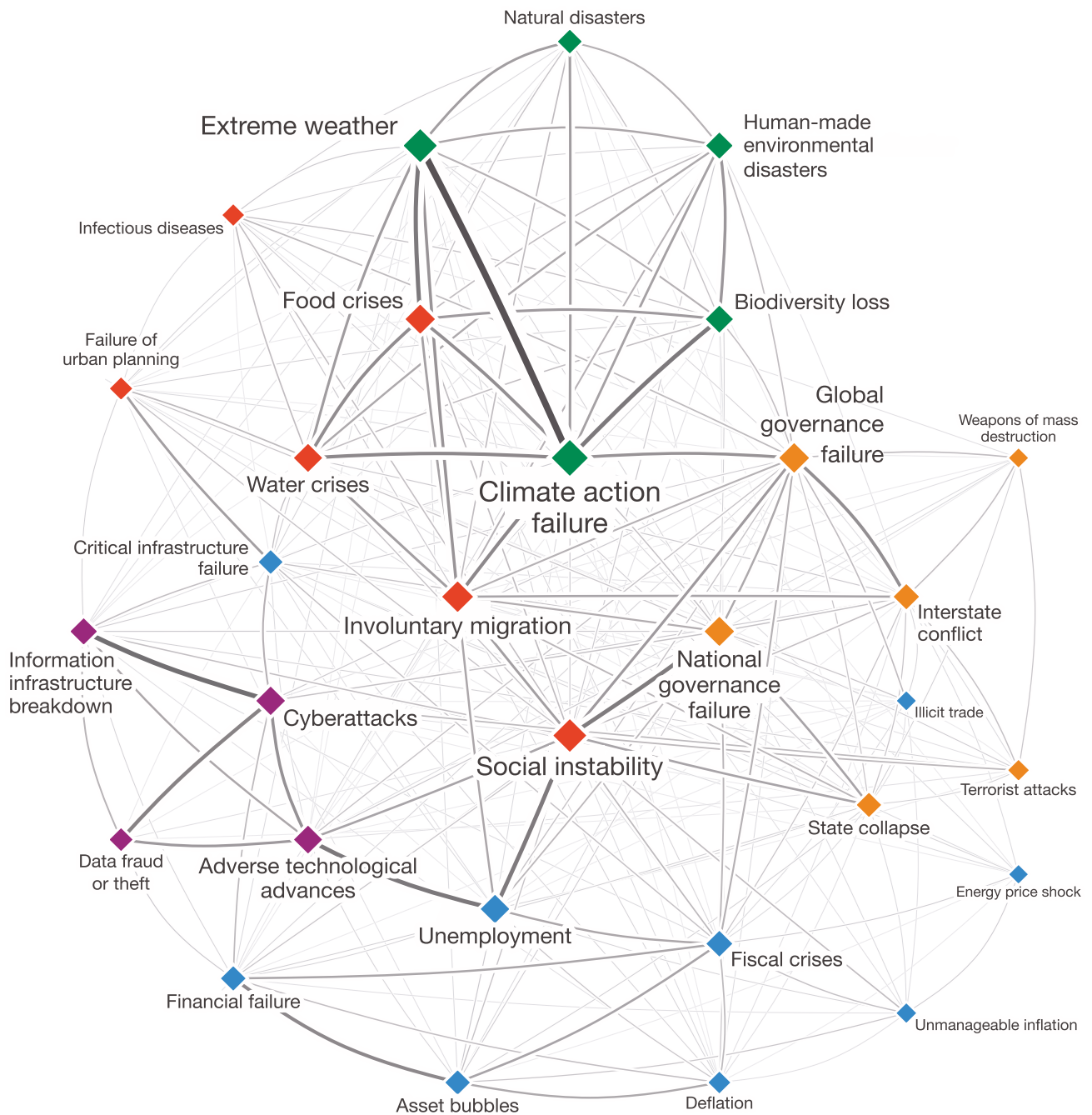
Technological Governance Deficits

Emerging technology risks can erode social discourse, threaten economic stability, exacerbate geostrategic competition, and pressure national and international security. Getting a better handle on systemic risks will require a significant technology governance refresh at all levels

Creaking Health Systems

Changing societal, environmental, demographic, and technological trends are straining health systems globally. While transformative technology, medicines, and insurance can improve healthcare, they also introduce new risks and trade-offs.

2020 Global Risks Interconnections



Source: [World Economic Forum – Global Risks Report 2020](#)

Risk outlook: the world in 2020

The Global Risks Report forecasts a year of increased domestic and international divisions with the added risk of economic slowdown. 78% of survey respondents said they expect “economic confrontations” and “domestic political polarization” to rise in 2020. Global experts also see the risk of extreme heat waves and destruction of natural ecosystems increasing, as well as a rise in cyber-attacks targeting operations and infrastructure and data/money theft.











Short-Term Risk Outlook

Percentage of respondents expecting risks to increase in 2020

Multistakeholders

	Economic confrontations	78.5%
	Domestic political polarization	78.4%
	Extreme heat waves	77.1%
	Destruction of natural ecosystems	76.2%
	Cyberattacks: infrastructure	76.1%
	Protectionism on trade/investment	76.0%
	Populist and nativist agendas	75.7%
	Cyberattacks: theft of money/data	75.0%
	Recession in a major economy	72.8%
	Uncontrolled fires	70.7%

Global Shapers

	Extreme heat waves	88.8%
	Destruction of ecosystems	87.9%
	Health impacted by pollution	87.0%
	Water crises	86.0%
	Uncontrolled fires	79.8%
	Economic confrontations	78.4%
	Loss of trust in media sources	77.1%
	Loss of privacy (to companies)	76.2%
	Loss of privacy (to governments)	76.1%
	Domestic political polarization	75.3%


























 Economic  Environmental  Geopolitical  Societal  Technological

Note: The Global Shapers Community is the World Economic Forum’s network of young people driving dialogue, action and change.

Source: [World Economic Forum – Global Risks Report 2020](#)

Risk outlook: a sharper focus on environmental threats over the next 10 years

Concerns about environmental risks have been rising over the last decade. For the first time in the history of the survey’s 10-year outlook, environmental threats dominate the top five long term risks by likelihood and occupy three of the top five spots by impact.

Top 10 risks in terms of Likelihood	Top 10 risks in terms of Impact	Categories
 Extreme weather	 Climate action failure	 Economic
 Climate action failure	 Weapons of mass destruction	 Environmental
 Natural disasters	 Biodiversity loss	 Geopolitical
 Biodiversity loss	 Extreme weather	 Societal
 Human-made environmental disasters	 Water crises	 Technological
 Data fraud or theft	 Information infrastructure breakdown	
 Cyberattacks	 Natural disasters	
 Water crises	 Cyberattacks	
 Global governance failure	 Human-made environmental disasters	
 Asset bubbles	 Infectious diseases	

Source: [World Economic Forum – Global Risks Report 2020](#)

The Evolving Risks Landscape, 2007-2020

Top 5 Global Risks in Terms of Likelihood

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 st	Infrastructure breakdown	Blow up in asset prices	Asset price collapse	Asset price collapse	Storms and cyclones	Income disparity	Income disparity	Income disparity	Interstate conflict	Involuntary migration	Extreme weather	Extreme weather	Extreme weather	Extreme weather
2 nd	Chronic diseases	Middle East instability	China economic slowdown	China economic slowdown	Flooding	Fiscal imbalances	Fiscal imbalances	Extreme weather	Extreme weather	Extreme weather	Involuntary migration	Natural disasters	Climate action failure	Climate action failure
3 rd	Oil price shock	Fallen and falling states	Chronic diseases	Chronic disease	Corruption	Greenhouse gas emissions	Greenhouse gas emissions	Unemployment	Failure of national governance	Climate action failure	Natural disasters	Cyberattacks	Natural disasters	Natural disasters
4 th	China hard landing	Oil price shock	Global governance gaps	Fiscal crises	Biodiversity loss	Cyberattacks	Water crises	Climate action failure	State collapse or crisis	Interstate conflict	Terrorist attacks	Data fraud or theft	Data fraud or theft	Biodiversity loss
5 th	Blow up in asset prices	Chronic diseases	Deglobalization (emerging)	Global governance gaps	Climate change	Water crises	Population ageing	Cyberattacks	Unemployment	Natural catastrophes	Data fraud or theft	Climate action failure	Cyberattacks	Human-made environmental disasters

Top 5 Global Risks in Terms of Impact

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 st	Blow up in asset prices	Blow up in asset prices	Asset price collapse	Asset price collapse	Fiscal crises	Financial failure	Financial failure	Fiscal crises	Water crises	Climate action failure	Weapons of mass destruction	Weapons of mass destruction	Weapons of mass destruction	Climate action failure
2 nd	Deglobalization (developed)	Deglobalization (developed)	Deglobalization (developed)	Deglobalization (developed)	Climate change	Water crises	Water crises	Climate action failure	Infectious diseases	Weapons of mass destruction	Extreme weather	Extreme weather	Climate action failure	Weapons of mass destruction
3 rd	Interstate and civil wars	China hard landing	Oil and gas price spike	Oil price spikes	Geopolitical conflict	Food crises	Fiscal imbalances	Water crises	Weapons of mass destruction	Water crises	Water crises	Natural disasters	Extreme weather	Biodiversity loss
4 th	Pandemics	Oil price shock	Chronic diseases	Chronic disease	Asset price collapse	Fiscal imbalances	Weapons of mass destruction	Unemployment	Interstate conflict	Involuntary migration	Natural disasters	Climate action failure	Water crises	Extreme weather
5 th	Oil price shock	Pandemics	Fiscal crises	Fiscal crises	Energy price volatility	Energy price volatility	Climate action failure	Infrastructure breakdown	Climate action failure	Energy price shock	Climate action failure	Water crises	Natural disasters	Water crises

■ Economic
 ■ Environmental
 ■ Geopolitical
 ■ Societal
 ■ Technological

Source: World Economic Forum – Global Risks Report 2020

The Global Risks Report 2020 is available on:
<https://www.weforum.org/reports/the-global-risks-report-2020>





Section 16

2020 Calendar
of Events

The COVID-19 pandemic has caused many events to be postponed for an indefinite time

January

- **13-16 January** – International Water Summit 2020/World Future Energy Summit 2020/ EcoWASTE 2020, Abu Dhabi, UAE
- **28 January** – High-level Conference “Green Central Asia” in the framework of the new EU Strategy for Central Asia and Afghanistan, Berlin, Germany

February

- **2 February** – World Wetlands Day

March

- **4-5 March** – Final meeting of the EU-Central Asia Network for Water Science and Technology, Almaty, Kazakhstan
- **14 March** – International Day of Rivers
- **22 March** – World Water Day
- **22-27 March** – Capacity Building Workshop for Young Researchers in Water Policy Studies, Bishkek, Kyrgyzstan
- **26 March** – Aral Sea Day
- **30-31 March** – 2nd meeting of the Expert Group on the Transboundary Water Allocation Handbook under the UNECE Water Convention (via a videoconference)

April

- **10 April** – 78th ICWC meeting (via a videoconference under the chairmanship of Kazakhstan)

May

- **19 May** – Preparatory meeting for the 11th meeting of the Implementation Committee under the UNECE Water Convention (via a videoconference)
- **22 May** – International Day for Biological Diversity
- **12 May-4 June** – Webinar series on SDG indicator 6.5.2: Supporting Countries in Preparing National Reports for the 2nd Reporting Exercise, <http://www.unece.org/index.php?id=54333>

June

- **5 June** – World Environment Day (Environmentalists' Day)

12 June – Conference “Women and Water Governance at Local, National and Transboundary Level” by GKU (via a videoconference)

17 June – World Day to Combat Desertification and Drought

23-24 June – Berlin Climate and Security Conference 2020 hosted by the German Federal Foreign Office (via a videoconference)

July

9, 16, 23 July – Webinar series “Coordinating, Implementing and Financing National Climate and Water Policy Frameworks”

28-29 July – Workshop on designing legal frameworks for transboundary water cooperation under the UNECE Water Convention (via a videoconference)

August

12 August – Caspian Sea Day

22 August – Earth Overshoot Day

30 August-1 September – Global Water Summit 2020, Madrid, Spain

31 August-1 September – 11th meeting of the Implementation Committee under the UNECE Water Convention, Geneva, Switzerland

September

14-20 September – Innovative Online 11th Central Asian Leadership Programme on Environment for Sustainable Development, Almaty, Kazakhstan

21-25 September – XVII World Water Congress, Daegu, Korea

24-25 September – 1st International Conference on “Improving Water Resources and Environmental Management in the Face of Growing Uncertainty” (IWREM -2020), TIAME, Tashkent

30 September-1 October – 15th meeting of the Working Group on Integrated Water Resources Management, Geneva, Switzerland (or via a videoconference)

October

2 October – 11th meeting of the Task Force on Water and Climate Change under the UNECE Water Convention, Geneva, Switzerland

3-5 October – “InterCarto. InterGIS 26”, Tashkent, Uzbekistan

14-16 October – 1st International Conference on Energetics, Civil and Agricultural Engineering 2020, Tashkent, Uzbekistan

- **14-17 October** – 2nd Asian International Water Week, Bali, Indonesia
- **15 October** – International Day of Rural Women
- **20-21 October** – 3rd meeting of the Expert Group on the Transboundary Water Allocation Handbook under the UNECE Water Convention, Geneva, Switzerland
- **22-23 October** – 6th meeting of the Task Force on the Water-Food-Energy-Nexus under the UNECE Water Convention, Geneva, Switzerland

November

- **9-20 November** – 26th Session of the Conference of the Parties (COP 26), 16th session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol and the 3rd Session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement, Glasgow, UK
- **30 November-3 December** – 1st International Water Association Digital Water Summit, Bilbao, Spain

December

- **14-15 December** – 12th Implementation Committee meeting under the Water Convention, Geneva, Switzerland
- **16-18 December** – Global Workshop on Financing Transboundary Water Cooperation and Basin Development, Geneva, Switzerland

Dates to be specified

- GIS in Central Asia Conference – GISCA 2020, Tashkent, Uzbekistan (via a videoconference)
- 3rd Water and Peace Seminar, Delft-Hague, the Netherlands

