

The background features a repeating pattern of overlapping circles. On the left side, there is a vertical column of solid blue circles. The rest of the page is filled with a grid of white circles, each containing a complex, multi-layered geometric pattern of concentric lines that resemble stylized water droplets or ripples.

Section 11

Key Water Developments
in the World

11.1. Africa

Construction of the Grand Ethiopian Renaissance Dam on the Nile River in Ethiopia. On July 19, Ethiopia announced the [completion of the second filling](#) of the dam's reservoir, without the agreement of Egypt and Sudan. According to Ethiopia, the \$5 billion dam, whose construction reached 80% completion, is important to its economic development and power generation. But Egypt considers the dam as a serious threat to its water supply from the Nile on which it relies almost entirely to meet its freshwater needs. Sudan is also concerned about the dam's safety and impact on its own dams and water stations. The dispute between Sudan and Ethiopia over the dam escalated in 2021 and culminated in April in Egyptian threats of carrying out a military action if Addis Ababa took the step, which the two downstream countries regard as a threat to their national and water security. In June, the Arab League issued a resolution rejecting any measures that undermine Egypt's and Sudan's share of Nile water and called on the United Nations Security Council (UNSC) to intervene to resolve the crisis which threatened peace and security in the region. On 8 July 2021, the U.N. Security Council held a session to discuss the dispute over the dam filling. The UNSC issued a statement, which said that negotiations should resume at the invitation of the African Union's (AU) chairman "to finalize expeditiously the text of mutually acceptable and binding agreement on the filling and operation of the GERD, within a reasonable time frame," without specifying a deadline. The [Democratic Republic of the Congo](#), current chair of the AU, has since sought to urge the three countries to resume negotiations, but without making any progress. The possibility of resuming negotiations was further complicated by the turmoil in Sudan, as Sudanese Gen. Abdel Fattah al-Burhan led a military coup on October 25. This prompted the AU to suspend Sudan's membership and freeze its participation in all AU activities. [Ethiopia](#) is accused of pushing for the freezing of Sudan's AU membership to find a logical reason for the international community to postpone the GERD negotiations for a later time.

Source: <https://www.al-monitor.com/originals/2021/11/new-egyptian-ethiopian-escalation-over-nile-dam>



The dam is 80 percent complete and is expected to reach full generating capacity in 2023 [Photo: Tiksa Negeri/Reuters]

Egypt Inaugurates the world's largest wastewater plant. The Bahr El-Baqar wastewater treatment plant, located in the northern governorate of Port Said, was inaugurated on 27 September 2021. With a treatment capacity of five million cubic meters per day, the wastewater treatment plant consists of four water treatment lines with a daily processing capacity of 1,250,000 cubic meters each. It will triple-treat and optimize water quality for irrigating local crops, to reclaim and cultivate approximately 400,000 feddans of farmland east of the Suez Canal. The plant holds three Guinness World Records: it is the largest structure of its kind as well as the world's biggest solar-powered sludge drying system comprising 250,000 square meters. This is a part of Egypt's efforts on maximizing all its water resources to meet the growing domestic needs amid the stalled negotiations over GERD. The government has drafted a US\$ 50 billion [water resources strategy](#) that extends until 2050 and may climb to US\$ 100 billion. A four-point plan to cope with the water crisis: rationing water use, improving water quality, providing additional water sources and creating a suitable climate for optimal water management.

Hundreds of people have fled its northern border with Chad after an **ongoing conflict over water between cattle ranchers and fishermen** killed 18 people and wounded 70. Frequent conflicts occur between the Mousgoum fishermen and Arab Choua cattle ranchers over water from the [Logone River separating Cameroon from Chad](#). The Logone and Chari Division is part of the Lake Chad Basin. Nigeria, Cameroon, Chad, the Central African Republic, Niger and Benin, member countries of the Lake Chad Basin Commission, say the lake's water resources have diminished by 70% within the past 50 years. Cameroon says the advancing desert has pushed farmers, fishermen and cattle ranchers to settle along the Logone River for survival.

Over the last few months (July-November), **intense flooding** has affected more than 850,000 people in **South Sudan**, affecting 33 out of 78 counties. The floods are taking place around in areas along the Nile and Lol rivers and in the Sudd marshlands. The United Nations has described the situation as "the worst flooding in decades".

Source: Counting the cost 2021: A year of climate breakdown, Christian Aid, December 2021

Officials in **four West African countries** signed a [declaration](#) to advance transboundary cooperation in the Senegal-Mauritanian Aquifer Basin (SMAB). The declaration signifies the willingness of ministers from Gambia, Guinea Bissau, Mauritania and Senegal to establish a legal and institutional framework for cooperation on SMAB for the first time in the region's history. The basin is the largest in the Atlantic margin of north-west Africa and supplies water to more than 24 million people.

Kenya's first wildlife census report. Kenya's black rhino, sable antelope, hirola, Tana River mangabey

and roan antelope are 'critically endangered'. The [three-month survey](#) began in April 2021 and covered over 30 species of mammals, birds and marine wildlife in various ecosystems, using the geographic information system (GIS), camera traps, helicopters, vehicles and boats. It was undertaken by the tourism and wildlife ministry, Kenya Wildlife Services and the Wildlife Research and Training Institute (WRTI) to establish a national baseline of the wildlife species. Among other iconic species, the researchers counted 41,659 buffalo, 13,530 Maasai giraffes, 121,911 common zebras, 2,649 grevy's zebras and 57,813 wildebeest. Livestock incursions, logging, charcoal burning and illegal settlements near major wildlife sanctuaries were observed during the survey period. Other threats to wildlife are habitat loss, land-use changes and exponential human population growth, according to the census report.

The **first wind turbine for Sudan's** first commercial wind-energy plant arrived from the Netherlands at the site on June 14, in a major milestone for the country and the continent. The administration has already begun the task of constructing the 100 megawatt (MW) plant, which will be completed in 15-21 days. The project has been funded by the Sudanese government and the Global Environment Facility. Dongola is one of three sites identified by the government-commissioned Sudan Wind Atlas as having the potential to host wind power projects. Sudan faces significant challenges in

ensuring access to affordable, reliable, sustainable and modern energy to its citizens. Hydroelectric power has the largest share of energy generation in the country, but the potential to expand hydroelectric power to meet future needs is limited. This is because rainfall patterns affected due to climate change may also affect hydroelectric power. Sudan, Africa's third-largest country, will require 8,675 MW of additional thermal power plants by 2030. Since it has no significant oil or gas reserves, it will have to import fossil fuels. Under such circumstances, the Dongola wind project is a step in the right direction for promoting the use of wind energy in Sudan. The project is expected to serve as a [role model for other African countries](#) keen on enhancing their renewable energy capacity.

African Development Bank approved new Water Strategy for 2021-2025 on November 17. The [Strategy](#) aims to increase water security and foster sustainable, green and inclusive growth and development in Africa. The Water Strategy's four pillars underscore the importance of water and sanitation for socio-economic development; sustainability, resilience, and inclusivity; food production and nutrition; and hydro-power. Since 2010, the African Development Bank has invested an estimated US\$ 6.2 billion in water supply and sanitation services. At the end of October 2021, the Bank's active water sector portfolio stood at US\$ 5.02 billion, comprising 104 projects implemented in 40 countries, and five multinational projects.

11.2. Asia

Afghanistan

As of 2021, the population of Afghanistan is 40.2 million, while the area is about 653 thousand km².

In November 2020, during the Conference on Afghanistan, the development partners made their commitments to allocate US\$ 3.3 billion to the country in 2021. The Afghanistan National Peace and Development Framework prolonged for 5 years since 2021 till 2025 was to guide the joint efforts of the Government and international partners in developing market, sovereignty, and peace.

Political regime change, natural disasters and humanitarian aid. Since late 2020 Afghanistan has suffered from drought, which continued in 2021. The drought had a severe impact in 25 of 34 country's provinces. The situation worsened when in August 2021 Taliban took the control over the country, forcing thousands of people leave the country. Many farmers have lost their crops and animals. Afghanistan is experiencing a [humanitarian crisis](#) on an unprecedented scale, with unprecedented speed. According to UN, today in Afghanistan 22.8 million are undernourished and 8.7 million are suffering from hunger.

Since August 2021, the humanitarian aid from western countries and development partners to Afghanistan has suspended and the external assets of the Afghanistan's Central Bank have been frozen. Despite the Taliban's efforts, the economic situation re-

mains severe. China established direct communications with Taliban's administration and was the first country to commit urgent humanitarian assistance at almost US\$ 30 million. The both sides had bi- and multilateral meetings to discuss recovery in Afghanistan.

Dams. [Kamal Khan Dam](#) built on the Helmand River in Nimroz province on the border with Iran was put into operation on March 24. The hydroelectric plant produces 9 MW of electric power in addition to providing irrigation to about 175,000 ha of agricultural land. Its reservoir has the capacity to store up to 54 million m³ of fresh water. First releases of water for irrigation were made in January 2022.

The Sokhtak power dam located near the Harirod River in central Daikundi province was put into operation in April. The dam has a capacity of producing 700kW of electricity. The construction work on another infrastructure project in western Herat province, the [Pashdan Dam](#), has been halted. The hydroelectric dam was scheduled for completion by the end of 2021. Due to reduced precipitation in 2021 resulting in [low river flows](#), water levels in Dahla and Kajaki reservoirs, and the Kamal Khan diversion dam has remained well below capacity.

ADB operations in Afghanistan

Since 1966, ADB has [committed](#) almost US\$ 5.39 billion in grants and provided US\$ 120.4 million in technical

assistance to Afghanistan. These amounts include ADB-administered co-financing. Cumulative lending totals US\$ 977.1 million. The Bank financed transport, energy, irrigation and agriculture sectors among other projects. The ADB's permanent technical assistance to Afghanistan has stopped since 15 August 2021.

WB operations in Afghanistan

Since April 2002, the International Development Association (IDA) has committed over US\$ 5.3 billion for development and emergency reconstruction projects, and 8 budget support operations in Afghanistan. This support comprises over US\$ 4.8 billion in grants and US\$ 436.4 million in no-interest loans known as "credits". As of 3 February 2021, the Bank has implemented 12 IDA-only projects (US\$ 940 million) and 15 projects jointly funded with ARTF, with net commitment value of over US\$ 1.2 billion from IDA.

Until August 2021, WB has supported a number of projects in **agriculture and land management** ("Afghanistan Land Administration System Project", IDA Grant – US\$ 25 million/ARTF Grant – US\$ 10 million; 'Emergency Agriculture and Food Supply Project', IDA Grant – US\$ 55 million/ ARTF Grant - US\$ 45 million) and energy (CASA-1000, US\$ 526.5 million; "Herat Electrification Project", IDA Grant – US\$ 60 million; "Naghlu Hydropower Rehabilitation", US\$ 83 million).

Source: The World Bank Group in Afghanistan: Country Update; <https://documents1.worldbank.org/curated/en/4511816171930719/pdf/The-World-Bank-Group-in-Afghanistan-Country-Update.pdf>

UNDP operations in Afghanistan

In 2021, before the political regime change, the UNDP project portfolio included 58 projects at the total cost of US\$ 449.97 million. The projects were focused on **SDGs** ("UNDP SDG Country Support Platform Initiation Plan", "Enhancing Integrated Financing for A-SDGs", "SDG Integration in Policy and Programming"), **agriculture** ("Community-Based Agriculture and Rural Development" in the east and west of the country and **access to international markets**), **climate change, ecosystems** ("Adapting Afghan Communities to Climate-Induced Disaster Risks", "Conservation of snow leopards and their critical ecosystem in Afghanistan"), **energy** ("Afghanistan Sustainable Energy for Rural Development") and **gender** ("Enhancing Gender Equality & Mainstreaming in Afghanistan").

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 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 far-

mers for improved food & nutrition security, resilience, and emergency response to natural and man-made disasters and climate change.

Despite the political transition, FAO continued supporting Afghanistan in order to keep agriculture, the backbone of country's economy, afloat. In the last quarter of 2021, FAO supported 1.37 million people amid a rapidly worsening humanitarian crisis. In the cold season, about 1.3 million people across 31 provinces of Afghanistan's 34 provinces received wheat packages including high-quality local crop seeds, fertilizers, and training.

USAID operations in Afghanistan

Agriculture. In 2010, USAID established an Agricultural Development Fund (US\$ 100 million budget) to provide credit to small commercial farmers and agribusinesses. As of March 2021, the Fund allocated US\$ 132.7 million in credits to more than 43.6 thousand Afghan farmers to buy seeds, fertilizers, equipment, and fodder.

Source: www.usaid.gov/afghanistan/agriculture

On October 28, the United States announced more than **US\$ 144 million in humanitarian assistance** to the people affected by the ongoing humanitarian crisis in Afghanistan. This funding from USAID and the U.S. Department of State brought total U.S. humanitarian aid in Afghanistan to nearly US\$ 474 million in 2021 alone. This assistance, which includes more than US\$ 100 million from USAID, comes as Afghanistan faces increasing food insecurity and will flow through independent humanitarian organizations. It includes food and nutrition assistance, protection, essential health care, agriculture, and winterization assistance, as well as support to transport aid workers and critical relief supplies into Afghanistan, in response to the growing humanitarian needs exacerbated by the current economic contraction, COVID-19 pandemic, and natural disasters, including drought.

China

2021 is the first year of the 14th Five-Year Plan; 2021 is also the first year after China set the 2060 carbon neutrality target. The 14th Five-Year Plan adopted in October 2020 outlines the main ideas for China's economic and social development from 2021 to 2025. **The main points outlined in the framework of the 14th five-year plan that are shaping the future of the "ecological civilization" and its environmental repercussions abroad are as follows:** localization of key production chains inside China to prevent "de-industrialization" and ensure economic security amidst geopolitical competition; less emphasis on the export of industrial equipment and the transfer of "excess capacity" to other countries; legislative regulation of the selection of key projects to be implemented overseas based on such criteria as inclusiveness, affordability and resilience to risks; combining the construction of the "green" Belt and Road with cooperation in climate change, sea protection, protection of fauna and combating desertification. Also, trading

rights schemes (property, pollutant, water) & eco-compensation schemes will play a big role; no GDP growth targets set & **5/8 binding targets pertain to "green ecology"**, one is water. China announced that the 14FYP **water usage target** per unit of GDP is to be reduced by 16% by 2025 and that total water use will be capped at 670 bnm³ in 2025.

On May 26, 2021, the Ministry of Ecology and Environment (MEE) released the **2020 State of Ecology and Environment Report**. The key highlights of the report are as follows. In 2020, key targets set in 13FYP have been met & exceeded + 39k sewage treatment facilities have been built & violation cases down, likely due to increased compliance. Groundwater & shallow groundwater still far from Water Ten targets as water that is fit for human have slightly worsened; meanwhile, surface water continues to improve. Significant improvement across the main river basins; 6/7 meet both Water Ten targets & completely eliminated Grade V+ water (meaning not suitable for any use); only Hai river needs a bit more work.

Part I of the **COP-15 UN Convention on Biological Diversity (CBD)** took place in Kunming, Yunnan Province, China on October 11-24. Originally to be held in 2020, the COP-15 was divided into two parts: Part I to be held online and Part II in-person in 2022. Part I of the Kunming Conference outlined the **post-2020 global biodiversity framework** and established the Kunming declaration. The key outcomes of the meeting were as follows: 1) the participating countries committed to the negotiation of adopting an effective post-2020 global biodiversity framework; 2) the government of China announced about US\$ 233 million Kunming Biodiversity Fund. The government of Japan joined in with their support of about US\$ 17 million; 3) GEF, UNDP, and UNEP announced they would fast-track support developing countries through preparing and updating their National Biodiversity Strategies and Action Plans (NBSAPs); 4) different groups, including financial institutions were joining the commitment of protecting biodiversity.

China Belt and Road Initiative (BRI) investments in 2021: BRI finance and investments stabilized in 2021 at US\$ 59.5 billion (compared to US\$ 60.5 billion in 2020); No coal projects received financing in 2021; Green energy finance and investments in the BRI slightly increased to a new high in 2021 at US\$ 6.3 billion; Strong shift of engagement to African and Arab countries, as well as more construction in South America; Oil-related finance and investments in the BRI expanded from to US\$ 6.4 billion in 2021 (compared to US\$ 1.9 billion in all of 2020); Iraq was the largest beneficiary from China's BRI in 2021, with about US\$ 10.5 billion in construction contracts; Chinese BRI financing accelerated particularly in the health and utilities sectors.

In July, **torrential rains in the Chinese province of Henan** caused massive floods and the death of 302 people. More than 1 million people had to be relocated and hundreds of thousands lost their houses. In Zhengzhou, capital city of the province, 617.1 mm of rain fell in three days, an amount similar to the annual average for the region. According to an estimate,

the damage caused by the floods amounted to US\$ 17.6 billion.

Source: Counting the cost 2021: A year of climate breakdown, Christian Aid, December 2021

China starts Baihetan hydro project. The giant Baihetan hydropower plant (16 GW) on the upstream branch of China's Yangtze River has begun generating electricity through two turbines in June 2021. The project will eventually consist of 16 units, making its total generation capacity second only to the Three Gorges Dam once it is completed in July next year. It was one of **China's biggest and most challenging engineering projects**, with a dam height of 289 metres (948 feet); it has taken only four years to build. It is part of a cascade of dams on the Jinsha River, which is the upstream section of the Yangtze. The **10.2-GW Wudongde hydro project**, built upstream on the Jinsha from Baihetan, was put into full operation in mid-June.



The **"Green development guidelines for overseas investment and cooperation"**, issued jointly by the Ministry of Commerce (MOFCOM) and the Ministry of Ecology and Environment (MEE), encourage Chinese businesses to integrate green development throughout the overseas investment process. Where local standards are insufficient, they also suggest that companies should "follow international green rules and standards". As such, they represent a step away from China's traditional reliance on host country rules and could pave the way for the implementation of much higher standards in infrastructure projects under the Belt and Road Initiative (BRI). The guidelines call for strengthening engagement with host country environmental protection organizations. They also name non-fossil energy technologies as key areas for investment. The document is a significant upgrade. The emphases have shifted from a bare minimum of pollution control that meets host countries' standards towards the promotion of a "green development concept" and encouragement of higher standards used in host countries where appropriate. Across all three aspects of climate, pollution and biodiversity, the **2021 guidelines** now include specific climate-

positive measures (e.g. support overseas clean energy investment). Furthermore, Chinese enterprises are asked to “prevent adverse impacts on biodiversity” according to host country laws or international practices. Finally, the guidance also promotes controlling the discharge of waste gas, water, noise and solid waste, and enhancing the integrated reuse of waste.

Other Asian Countries

India's groundwater level continued dropping. India is the world's second-largest producer of wheat and rice. But this production relies on groundwater irrigation. At just over 260 km³ per year, India is said to use 25% of all groundwater extracted globally, ahead of the USA and China. The Central Ground Water Board (Government of India) states that groundwater irrigation accounts for over 60% of the total area irrigated in the country and about 85% of the rural drinking water supply. According to a study published in 2021, groundwater depletion is already having a negative impact on the production of staple grains, particularly in the winter growing season. For every 1 m of groundwater depletion, the production of winter wheat, winter maize, winter rice, and monsoon rice decreases by 2-6%. If farmers lose access to all critically depleted groundwater, [India could lose up to 20% of winter cropped area](#).

Dozens of people have died and many are still missing after a **devastating flood** in the Himalayan area of Chamoli in Uttarakhand, northern India. The deluge left the Rishiganga hydroelectric power project almost entirely buried under mud and ice. Another dam project on the Dhauliganga River was also severely damaged. Experts say one possibility of the flood is that [massive ice blocks broke off a Himalayan glacier](#) into a river due to a temperature rise, releasing a huge amount of water.

In 2021, **India and Bangladesh have agreed to expand cooperation** across the entire gamut of water resources issues, including framework for sharing of river waters, mitigation of pollution, river bank protection, flood management, basin management. Noting that India and Bangladesh share 54 common rivers, both sides commended the [close cooperation](#) that exists between them in the matter. Particular attention will be paid to flood forecasting.

In September 2021, a **Thailand's** project was approved that will divert an average of 1.8 thousand m³ of water annually to irrigate the central plains. [This 30-year-old project](#) will be the first to dam the Yuam River on Thailand's northwestern border with Myanmar – tributary of the Salween, one of the last free-flowing rivers left in the world. The project cuts through five national forest reserves and the forthcoming Mae Ngao National Park. It will clear a total of 582 ha of forest, 206 of which are classified as crucial for ensuring the continuity of the watershed. Construction materials and the debris from creating the tunnel will be dumped in six mounds along the way, covering 71 ha, most of which are the ancestral lands of indigenous communities. Civil society groups are rushing to mobilize communities whose homes and livelihoods will be affected.

Singapore turns sewage into clean, drinkable water.

The tiny island nation has little in the way of natural water sources and has long had to rely principally on supplies from neighboring Malaysia. To boost self-sufficiency, the government has developed an advanced system for treating sewage involving a network of tunnels and high-tech plants. Recycled wastewater can now meet 40% of Singapore's water demand, a figure that is expected to rise to 55% by 2060. While most is used for industrial purposes, some of it is added to drinking water supplies in reservoirs in the city-state of 5.7 million people. And the system helps reduce maritime pollution, as only a small amount of the treated water is discharged into the sea. This is a contrast to most other countries: 80% of the world's wastewater flows back into the ecosystem without being treated or reused. At the heart of the recycling system is the high-tech Changi Water Reclamation Plant on the city's eastern coast. Parts of the facility in land-scarce Singapore are underground, some as deep as 25 stories, and it is fed by wastewater that flows through a massive, 48-kilometer (30-mile) tunnel, linked to sewers. The site houses a maze of steel pipes, tubes, tanks, filtration systems and other machinery, and can treat up to 900 million liters of wastewater a day – enough to fill an Olympic-sized swimming pool every 24 hours for a year. The end product, dubbed **NEWater**, is mainly used in microchip manufacturing plants, which require high-quality water, and for cooling systems in buildings. During the dry season, it is sent to top up several man-made reservoirs and, following further treatment, flows to people's taps.

Japan announced in April it will release more than 1Mt of contaminated water from the wrecked Fukushima nuclear power plant into the sea, a decision that has angered neighboring countries, including China, and local fishers. Work to release the diluted water will begin in about two years, with the entire process expected to take decades. [About 1.25 Mt of water has accumulated](#) at the site of the nuclear plant, which was crippled after going into meltdown following a tsunami in 2011. It includes water used to cool the plant, as well as rain and groundwater that seeps in daily. The water needs to be filtered again to remove harmful isotopes and will be diluted to meet international standards before any release. The radioactive water, which increases in quantity by about 140 t a day, is now being stored in more than 1,000 tanks, and space at the site is expected to run out around next autumn.

Since May till August, tropical cyclones of different severity – Tauktae, Yaas and Typhoon In-fa – affected **India, Maldives, Sri Lanka, Bangladesh, Japan, the Philippines and China**. More than 200 people died and over 1 million people had to be evacuated from their homes. The total economic losses were estimated at about US\$ 6.5 billion.

Source: Counting the cost 2021: A year of climate breakdown, Christian Aid, December 2021

In early August, **Mongolia** halted construction of a dam on the Ulz River flowing to the Torey Lakes within the Russian territory. This was due to a [decision](#) adop-

ted at 44th extended session of the UNESCO World Heritage Committee in the second half of July. The project will directly affect biosphere, agriculture, fisheries, and socio-economic situation in the south-east of Transbaikalia. The project also will have a long-term negative impact on the Landscapes of Dauria and the adjacent Torey Lakes. The Russian Ministry of Nature supported the decision on the assessments of impacts from the dam and called Ulan-Bator to conduct a joint environmental expertise of the project. Such an expertise is particularly relevant given that Mongolia has commenced the project in 2020 without prior notification to the Russian side.

Source: <https://www.ritmeurasia.org/news--2021-08-22--transgranichnaja-biosfernaja-zona-zabajkalja-mongolskoj-plotine-zapret-56081> (in Russian)

Large River Basins in South Asia

Mekong River Basin

The **Mekong River Commission (MRC)'s situation report** covering the period of the driest season, from November 2020 to May 2021, said that water levels on the Mekong in Laos and Thailand fluctuated, while water levels in Cambodia's Great Lake, which expands and contracts in rhythm with the flow of the Mekong, were lower than usual. Flows in the Mekong in the first five months of 2021 were higher than the long-term average due to releases from storage dams. While increased flows during dry months had some benefits for farmers along the lower Mekong, and could help stave off seawater intrusion in the Mekong Delta, the MRC stated that the recent erratic flow has affected navigation, river ecosystems, and riverbank stability on the lower Mekong. As a result, the MRC urged China and its four members – Cambodia, Laos, Thailand and Vietnam – to [share more data](#) on hydropower operations that are contributing to the increasingly wild fluctuation in water levels of the river. Although the region has experienced a string of droughts, and also faces the long-run effects of climate change, there is increasing evidence that China's dam-building spree has exacerbated these problems. In early January, shortly after a sudden sharp drop in water levels, Beijing did notify its downstream neighbors that its dams were filling reservoirs and flow would soon be restored to "normal operation status" – but only after the damage had been done.

In November, Germany was allocating a further **€1.45 million** to the MRC. The extra funding will bolster technical cooperation in implementing the MRC Strategic Plan 2021-2025 and is in addition to Germany's contribution of €3 million first announced in June 2021. This support focuses on capacity building for the MRC Core River Monitoring Network, an essential step towards getting more timely data and information about impacts of water infrastructure projects not only on the Mekong mainstream but also tributaries.

A Chinese contractor for the planned **Sanakham Dam in Laos** submitted a revised technical report to the Thai National Mekong River Committee, in the hopes of reducing concerns over the environmental ef-

fects of the dam. **Thailand did not accept the revisions**, claiming that the new report was still not sufficient and that more study is required. Thailand, being Laos's biggest purchaser of hydroelectricity exports, has already threatened to refuse to purchase power generated by the dam. Extensive damming has become a significant source of anxiety for Thailand and other downstream communities. In January 2020, Thailand filed a complaint with the MRC, about China's Mekong dams, after documenting community complaints about economic hardships suffered as a result of changes to river flows. Laos, meanwhile, has engaged in a dam-building spree in recent years, as it attempts to become the "battery" of South-East Asia. The country has built more than 50 dams in 15 years and another 50 are currently under construction.

[Interactive content](#) of Basin Development Strategy, Strategic Plan released in March to ease access. Hosted under the MRC website, the web [content](#) "Basin Development Strategy 2021-2030 and MRC Strategic Plan 2021-2025" covers 11 interactive sections, ranging from basin issues, challenges and risks to sustainable development opportunities, and strategy implementation. For the first time, the BDS 2021-2030 is prepared for a ten-year period and emphasizes on the changing role of the MRC – from one primarily focused on cooperation for knowledge acquisition and sharing, towards comprehensive cooperation on water resources development and management across the entire Mekong River Basin.

The [water-related situation](#) in Tonle Sap has become even worse than previous years, with water levels around three metres lower than in 2018 by mid-October. Tonle Sap, the largest lake in Southeast Asia, was long known as one of the most productive fisheries in the world. But climate change, unsustainable and illegal fishing and the proliferation of hydropower dams on rivers that feed Tonle Sap threaten the livelihoods of over one million Cambodians who depend on the lake.

The year 2021 marked the **fifth anniversary of the Lancang-Mekong Cooperation (LMC)**. In March 2016, the LMC was officially launched by leaders of China, Thailand, Cambodia, Laos, Myanmar and Vietnam. This mechanism is the China's answer to the Western-initiated and funded MRC. At the Sixth LMC Foreign Ministers' Meeting held on 8 June 2021, the Ministers reaffirmed the commitment of Lancang-Mekong Cooperation, which is to deepen good-neighbourliness and pragmatic cooperation among the six countries, contribute collective efforts to the socio-economic development of the LMC countries and enhance the well-being of their people, narrow the development gap among countries, advance South-South cooperation and enhance the implementation of the UN 2030 Agenda for Sustainable Development. The LMC countries in their [Joint Statement on Enhancing Sustainable Development Cooperation](#) committed to steadily implement the Five-Year Action Plan on Lancang-Mekong Water Resources Cooperation (2018-2022), exchange of hydrological information of the Lancang River, support green development efforts,

and deepen cooperation in agriculture, tourism, sports, media, gender equality, etc.

Brahmaputra and Indus River Basins

Indus Water Talks Resolve Little, But Raise Hope For Dialogue. On March 23-24, the Permanent Indus Commissioners (PIC) of [India and Pakistan met](#) in New Delhi. Under the 1960 Indus Waters Treaty (IWT) between the two countries, the PICs are supposed to meet at least once a year. But India cancelled the 2019 meeting in the wake of a terrorist attack in Kashmir. The 2020 meeting could not be held due to the COVID-19 pandemic. In previous meetings of the PICs, Pakistan had objected to the designs of the 1,000 MW Pakal Dul and Lower Kalnai projects on the Chenab River. Once again, the Indian delegation is reported to have said that the details would be provided later. But this was an important signal that the two governments have started to talk. According to provisions of the Indus Waters Treaty, all the waters of the Eastern Rivers (Sutlej, Beas, and Ravi) is allocated to India for unrestricted use and the waters of the Western rivers (Indus, Jhelum, and Chenab) largely to Pakistan. Under the treaty, India has been given the right to generate hydroelectricity through run-of-the-river projects on the western rivers, subject to specific criteria for design and operation. It also gives the right to Pakistan to raise concerns on the design of Indian hydroelectric projects on western rivers.

In 2021, India was working on exercising its rights to stop excess water flowing to Pakistan under the Treaty to irrigate its own lands. This is also of strategic importance to India, given that control over river water flow acts as a force multiplier during times of aggression. [India's plans to fully utilize its share of water](#)

under the treaty assume strategic importance against the backdrop of China developing the controversial China-Pakistan Economic Corridor in the region.

The 14th Five-Year Plan approved by China's National People's Congress (NPC) in March elevated renewable energy to an even more prominent position and included **hydropower development at the lower reaches of the Yarlung Tsangpo – the upper stream of the Brahmaputra River**. This has generated widespread speculation that China might soon start the construction of a [super-dam at Medog which is on the Great Bend of the Brahmaputra](#). Here the river plunges from the roof of the world, curling down towards the plains of India and Bangladesh. The idea is to build a 50-meter-high dam at an altitude of 3,000 meters and harness the river's energy as it falls 2,000 meters – at a rate of 15 meters of altitude dropped per kilometer traveled – along the world's longest and steepest canyon. Even though no official statement was made on the Medog dam, there is evidence suggesting that preparation works are underway. For instance, an agreement has been signed by the state-owned Power Construction Corporation of China and the government of the Tibet Autonomous Region to build the historic hydropower project in Tibet. This project is said to be able to generate 60 million kW of hydropower, which is more than three times the amount of electricity produced by the Three Gorges Dam. Given the importance of the Brahmaputra River to India's water and energy security (it accounts for nearly 30 percent of the country's freshwater resources and about 44 percent of its total hydropower potential) and the link to ongoing territorial disputes between India and China in the eastern Himalayas, India is wary of China's development plans for the river.

11.3. America

The newly elected constitutional assembly in **Chile** will begin a nine-month process of drafting a new constitution. [As reported](#), the new document could enshrine environmental protections, including access to clean water. The country's current constitution explicitly permits the privatization of water, which has allowed businesses to buy water resources in a country where 350,000 people currently do not have access to water.

[Brazil's government agencies warned of droughts](#) in late May as the country faces its worst dry spell in 91 years. The lack of rain across much of **Brazil** has negative implications for grain cultivation, livestock and electricity generation, as Brazil relies heavily on hydro dams for its power. The dry weather could lead to severe fires in the Amazon rainforest and Pantanal wetlands. Drier-than-normal weather has hurt production of sugar and coffee in Brazil, the world's largest supplier of those products, pushing up future prices for the commodities.

On November 22, in the case of **Mississippi v. Tennessee**, the Supreme Court of the United States issued its

[first ever decision](#) in a dispute between two U.S. states over a transboundary aquifer. The U.S. State of Mississippi sued the U.S. State of Tennessee (and the City of Memphis) in 2014, claiming that Memphis had stolen billions of gallons of Mississippi's groundwater. Tennessee asserted that transboundary groundwater resources in the United States should be subject to the same doctrine as transboundary surface waters, namely, the doctrine of equitable apportionment. The Justices' decision was unanimous with the Court dismissing Mississippi's case and holding that "the waters contained in the Middle Claiborne Aquifer are subject to equitable apportionment," and that U.S. states may not "exercise exclusive ownership or control" over interstate waters flowing within their borders. While the case involved an entirely domestic U.S. dispute, it is nonetheless an interstate dispute over cross-border groundwater resources. Thus, it could have a significant jurisprudential impact on the development of international law for transboundary groundwater resources.

On August 16, the Bureau of Reclamation announced that for the first time in the 99 years of govern-

mental record-keeping, it was **declaring a water shortage on the Colorado River**. Lake Mead, the largest reservoir in the US by volume, has drained at an alarming rate in 2021. Around 35% full, the Colorado River reservoir is at its lowest since the lake was filled after the Hoover Dam was completed in the 1930s. Lake Powell, which is also fed by the Colorado River and is the country's second-largest reservoir, recently sank to a record low and is now 32% full. Given the latest monthly projections, the agency announced **mandatory water cuts** were to kick in for Arizona, Nevada, and Mexico starting January 1st 2022. The shortage is **a product of climate change but also human stubbornness** regarding the politics of dividing up the water from the Colorado River. Despite a waning flow of water and populations becoming more and more concentrated in cities, the legal framework for sharing the Colorado River hasn't fundamentally changed since it was first written nearly 100 years ago.



Low water levels can be seen in the Hoover Dam reservoir of Lake Mead on June 9. Photo: Bridget Bennett/Reuters

Deforestation in Earth's largest rainforest surged 22% to the highest level since 2006. 13.2 thousand km² of rainforest – an area nearly the size the land area of the state of Maryland or the country Montenegro – was cleared in the Brazilian Amazon between August 1, 2020 and July 31, 2021. Deforestation has been on an upward trend in the Brazilian Amazon, which accounts for nearly two-thirds of the entire Amazon rainforest, since 2012. Scientists have warned that the ecosystem may be approaching a tipping point where vast areas of rainforest transition to a woody savanna.

In late August and early September, a **Category 4 hurricane called Ida** hit several parts of the United States. Ida caused landslides, power outages and flash floods in many Northeast states. In total, Ida caused 95 casualties and damages amounting to US\$ 65 billion. At the end of June and in the early days of July, an **unprecedented heatwave** brought hugely record-breaking temperatures to some parts of West North America. It set a Canadian temperature record of 49.6°C. As estimated, the total death toll is 1,037 people, 229 in the US and 808 in Canada. The **Paraná River** was at its lowest levels in the last 77 years. The river, which spans almost 5 thousand km across

Brazil, Argentina and Paraguay, plays a critical role in the region as a source of hydroelectric power and a very important trading route. The low levels are associated with reduced rainfall, which in the top of the Parana have plunged from a daily average of 160 mm in the 1990s to just half that amount now. Electricity production in the dams of Yacyretá and Itaipú has been affected.

Source: Counting the cost 2021: A year of climate breakdown, Christian Aid, December 2021

In **Chile**, environmental advocates are demanding justice for Javiera Rojas, a 42-year-old **land defender** who was found dead in late November in the northern Chilean region of Antofagasta. In 2016, she was involved in a campaign that successfully canceled a dam that would have stolen water from local communities and harmed wildlife. Latin America is the deadliest region in the world for land defenders. **Global Witness's annual report** found that in 2020, 227 environmental advocates were killed for the activism-half of which were from either Columbia, Mexico, or the Philippines. The report found that of the lethal attacks, 20 were linked to activists in the water and dams sector. Although the report's findings made 2020 the deadliest year on record for environmental activists, the numbers are most likely underestimated, since many attacks go unreported. Honduras is found as one of the most dangerous countries in the world for land and environment defenders.

In 2021, **Mexico** was in the grip of a **severe drought**, which has hit two-thirds of the country. The strain on water reserves was exacerbated by increased domestic demand during the COVID-19 pandemic. Roughly sixty other large reservoirs, mostly in northern and central Mexico, were below 25 percent capacity.

Plans to remove four dams on the Klamath River have taken a step forward with the news that the California Public Utilities Commission has approved a request to transfer ownership of four hydroelectric dams. The decision is part of the implementation of the Klamath Hydroelectric Settlement Agreement between 48 parties including PacifiCorp, the states of Oregon and California, several Native American tribes, and many other groups and organizations. The settlement agreement provides a framework to decommission the four hydroelectric developments. When completed, the dam removal project will address declines in fish populations, improve river health, and renew Tribal communities and cultures. The plan is to commence dam removal in 2023.

Canada's Federal Court and Manitoba's Court announced a **\$8-billion class-action settlement** had been approved for First Nations affected by years-long drinking water advisories. Thousands of people could receive compensation from the settlement, which includes any First Nations member whose land was subject to a water advisory¹⁰⁴ that lasted at least one year between November 8, 1995 and the present.

¹⁰⁴ Drinking water advisories are issued to warn people to not drink water that may be unsafe or is known to not be safe based on water quality test results. First Nations issue drinking water advisories in their communities. Provincial, territorial or local governments issue drinking water advisories off-reserve.

An Ecuadorian court rules against a mining operation in a protected rainforest in Los Cedros. The decision will force Ecuador's government to revoke mining permits to state mining company Enami and its Cana-

dian partner, Cornerstone Capital Resources. Ecuador became the first country in the world to include the rights to nature in its constitution.

11.4. Australia and Oceania

A bold new plan to manage Australia's Murray Darling Basin was rejected by the Senate in autumn. Australian officials rejected a plan by independent Senator Rex Patrick that would have put responsibility for managing the Murray Darling Basin in the hands of the commonwealth through a constitutional amendment. He warned the [Murray Darling Basin could become Australia's version of the Aral Sea](#), devoid of water, fish life and heavily degraded if not managed properly. The move came after a Senate inquiry into the bill determined that states (Queensland, New South Wales, Victoria and South Australia) were better equipped to assess local needs than the commonwealth. The plan currently in place to manage the basin, in which the commonwealth, through the Murray Darling Basin Authority, has an oversight role, has been criticized for not taking a more stringent approach to ensuring the states meet their obligations.

In an attempt to mitigate prolonged drought, Australian officials approved planning for a [new desalination](#) in Belmont, New South Wales. The plant will reportedly produce up to 30 million liters of water per day. The planning approval is supported by comprehensive environmental impact investigations, which indicate that potential impacts can be mitigated through detailed design and delivery.

In March, many parts of the **Eastern Australian coast** experienced massive rains and extensive flooding, causing two deaths. In coastal New South Wales, where the city of Sydney is located, the week of the floods became the wettest ever recorded. Around 18,000 people had to be evacuated from the region, with damages totaling \$2.1 billion.

the nationwide average temperature was 13.56°C. Annual temperatures in 2021 were above average – 0.51°C to 1.2°C higher – for much of Aotearoa. The highest temperature that reached 39.4°C was recorded on 26 January at Ashburton. The start of 2021 also featured extended dry spells in the North Island.

The [Water Services Act 2021](#) commenced November 15 in **New Zealand**. This Act is part of the Three Waters Reforms. It establishes drinking water standards and regulates all persons and organizations that supply drinking water. The main purpose of this Act is to ensure that drinking water suppliers provide safe drinking water to consumers. Previously only large scale water suppliers were captured by health regulations. Under the Act, any person who supplies water to another household or dwelling, which may be used for drinking water, is likely to be caught by the Act.

According to the latest summary by research agency Land Air and Water Aotearoa (Lawa), which collates data from 127 lake sites throughout **New Zealand**, 55 per cent of [monitored lakes](#) can be categorized as either poor or very poor. Less than 16 per cent of monitored lakes have water quality categorized as either very good or good, and the situation has not changed over the last decade. 75 per cent of monitored lowland lakes, often located in catchments with higher proportions of agricultural, urban or other development, were either poor or very poor. Researchers found native freshwater mussels could play a significant role in restoring the lakes' water quality by filtering the water.

Palau was hit by [Typhoon Surigae](#) in April. Surigae brought sustained winds of up to 80 km/h and gusts up to 135 km/h to Palau, causing power outages, downing water and cellular services across the island. The entire population of Palau, consisting of approximately 18,008 people, was impacted by the typhoon. The total amount of damage across health, infrastructure, education, food, communication, utilities and other sectors was assessed at US\$ 4.8 million.

The **Republic of Fiji** has signed a landmark agreement with the Forest Carbon Partnership Facility (FCPF) that will unlock up to US\$ 12.5 million for increasing carbon sequestration and [reducing emissions](#) from deforestation and forest degradation. Fiji is the first small island developing state to sign an Emission Reductions Payment Agreement.

Vanuatu, with a population of some 280,000 people spread across roughly 80 islands facing rising sea levels and more regular storms, asked the International Court of Justice to issue an opinion on the [rights of present and future generations to be protected from](#)



Cars trapped in rising floodwaters in Windsor, New South Wales. Photo: Leah-Anne Thompson/Shutterstock

Source: Counting the cost 2021: A year of climate breakdown, Christian Aid, December 2021

2021 was **New Zealand's hottest year** on record. The record, which is based on seven-station series, began in 1909. The previous record was set in 2016. In 2021

the adverse effects of climate change. In April, Tropical Cyclone Harold hit Vanuatu and demolished tourist resorts in another South Pacific island nation of Tonga. Vanuatu would route the initiative through

the UNGA. Though not being legally binding, the advisory opinions of the court carry legal weight and moral authority and can inform the development of international law.

11.5. Europe

11.5.1. Western and Southern Europe

The European Commission adopted its new [Strategy for Healthy Soils by 2030](#), announcing a dedicated legislative proposal for 2022. Part of the EU 2030 biodiversity strategy, this initiative will update the current strategy to address soil degradation and preserve land resources. The goals are to: protect soil fertility, lower erosion, increase organic matter, and define 'good ecological status' for soils.

The European Parliament and the Council of the European Union have agreed the [new EU climate law](#), sealing the goal of climate neutrality by 2050. The new law sets a binding EU greenhouse gas reduction target of at least 55% by 2030 compared to 1990 levels. The Commission will engage with economic sectors that wish to put forward voluntary roadmaps towards climate neutrality by 2050.

Extreme rainfall hit parts of **Western Europe** from 12-15 July, with some regions around the Ahr and Erft rivers in Germany experiencing more than 90 mm of rainfall over a single day. The resulting floods killed at least 240 people and caused widespread damage, with economic losses estimated at more than US\$ 43 billion.

In early April, a cold wave affecting large parts of central **France** caused great agricultural losses, in particular to vineyards. The government announced it would declare a state of agricultural disaster, a measure aimed at compensating affected farmers for their losses. In the Rhône region, farmers estimated that the cold spell may have destroyed more than 80% of their harvests. The cost of the impacts of the cold wave has been estimated at US\$ 5.6 billion.

Source: Counting the cost 2021: A year of climate breakdown, Christian Aid, December 2021

The environmental movement in **Albania** is fighting against government plans to build a number of [dams in the river Vjosa](#). It flows from Greece through southern Albania to the Adriatic Sea and is 272 km long. The dams will generate electricity with the help of hydro-power plants, but threaten the Vjosa River. Albania is not a European Member State. In the European Union many dams are removed to comply with the Water Framework Directive. A lawsuit was filed against the state on behalf of dozens of residents of the Vjosa river basin. They won the case in the first instance. The construction work has now stopped. But the state has lodged an appeal.

A [new audit](#) from the [European Court of Auditors](#) found that agricultural policies at both the EU and Member State level do not always follow EU water policies. The report includes recommendations to the European Commission, including linking common agricultural policy payments to environmental water standards and ensuring that EU-funded projects aim to

achieve the objectives of the Water Framework Directive.

Widespread water contamination in United Kingdom is highlighted in a new report, titled [Troubled Waters](#), from several environmental charities in the United Kingdom. The report found that agricultural waste, raw sewage and pollution from abandoned mines are harming water ways across the United Kingdom. Among its recommendations, the report calls for the transition to regenerative farming practices and urges water companies to stop releasing raw sewage into waterways. At the same time, the [UK doubles funding to tackle water pollution](#). In 2020, only 14% of the rivers in England were of good ecological health. In this context, the government is increasing funding to improve water quality to approximately €35 million a year to help farmers implement practical solutions to reduce pollution, with the aim of covering 100 per cent of farms by 2023.

The European Commission refers to **Ireland** to the European Court of Justice for failure to comply with the requirements of the Drinking Water Directive (November 12, [Press Release](#)). The Member States must ensure that water intended for human consumption is clean, and does not pose a potential danger to human health. In Ireland, the level of the chemical substance trihalomethanes in drinking water has long exceeded the parametric value established in the Drinking Water Directive. In 2016 Ireland also received a warning from the European Commission for not complying with the EU Urban Waste Water Treatment Directive that it has required towns and cities to collect their wastewater and treat it properly in order to make it safe for human consumption. Now, five years later, Ireland is again in violation.

A [referendum](#) on amendments to the Waters Act was held in **Slovenia** on July 11. In March 2021, the National Assembly passed the Waters Act, despite strong criticism from the experts and civil society. At the center of the dispute is a provision regulating the construction of buildings, including hotels, shops and restaurants, close to the sea, rivers or lakes. While the government insists it has actually tightened the rules and enabled more water and flood protection funds, opponents claim the regulations favor the interests of private investors and would limit public access to water and jeopardize its quality. The referendum was forced by a cluster of environmental organizations and civil society groups who collected more than 50,000 signatures. With one of the highest turnouts in recent history, the Act was overwhelmingly rejected by the voters.

The world's largest [vertical farm](#) will open in the **UK** in early 2022. The new multi-million pound farm will offer 148,000 m² of growing space and be able to supply

1,000 t of fresh produce to supermarkets across the country.

Rhine River Basin

The states in the Rhine catchment have been cooperating in the International Commission for the Protection of the Rhine (ICPR) for 70 years.

The Rhine and its tributaries are doing much better. Based on the successes achieved, further progress is needed to reach the good status. This is shown by the reports on the ecology and water quality of the Rhine adopted at the plenary session of the ICPR on July 1 and 2. The findings also flow into the [International River Basin Management Plan Rhine 2022-2027](#). The draft plan is available for public information and consultation since April 15. Completion and publication of the final version is scheduled for 22 March 2022.

Danube River Basin

The International Commission for the Protection of the Danube River (ICPDR) is an International Organization

consisting of 14 cooperating states and the EU. Since its establishment in 1998, the ICPDR deals with the whole Danube River Basin, which includes its tributaries and the groundwater resources.

In December, the ICPDR has adopted the [Danube River Basin Management Plan \(DRBMP\) Update 2021](#) together with the [Danube Flood Risk Management Plan \(DFRMP\) Update 2021](#). These two plans will set the course of the ICPDR's water management priorities for the Danube River Basin until 2027. The DRBMP Update 2021 sets out further aims to protect and enhance the status of all waters in the basin, and to prevent their deterioration while ensuring sustainable, long-term use of water resources. The plan also includes latest assessments on significant pressures, water status and a program of measures jointly agreed by the Danube countries for the next six years. It establishes and strengthens several integrated principles for river basin management and connections to other sectors' policies like energy, transport and adaptation to climate change. This is the second update to the DRBMP, which was first adopted in 2009.

11.5.2. Eastern Europe and Caucasus

Armenia

Water resources. By July, the five major reservoirs in Armenia have accumulated 210 Mm³ and 350 Mm³ less water than in 2020 and 2019, respectively. At the same time, 180 Mm³ less water was accumulated in the reservoirs of the Araks and Akhuryan river basins, and 30 Mm³ less in the Sevan-Razdan system. In March and April, water forecasts were quite good; however, starting from the last third of May, snow melted slowly and, consequently, water was quickly absorbed into the soil and no necessary surface runoff was formed. Thus, in June, the water level in most rivers dropped to 20-50% of the norm and even some of rivers had the flow 5 times lower than the norm.

In early November, a bidding process for the construction of the Kap reservoir on the Akhuryan River was started. The bidding process is to last until January 10, 2022. The construction was started as early as in the 80-s and has stopped after the collapse of USSR. Since project renewal in 2014, almost US\$ 37.5 has been invested in irrigation rehabilitation to transfer to the gravity-flow system. After completion of the 25-Mm³ reservoir and its capacity augmentation to 60 Mm³, the irrigation area can be extended substantially. The current cost of the project is estimated at €60 million.

Water supply and sanitation. The Government of Armenia, together with the German Development Bank KfW, the European Investment Bank (EIB) and the EU will allocate €81 million for water supply of over 100 thousand residents in several regions of Armenia. The beneficiaries of this program are the residents of 11 cities and 37 villages. It is planned to install 66 km of water pipes, repair 20 water intakes, a pumping station, build a distribution network (490 km long), and install household water pipes (180 km long).

Amendments were made in the Administrative Offenses Code providing for administrative liability for water pollution. The added new articles set administrative liability for discharge of sewage water into the rainwater drains, receipt of storm or drainage water into the centralized water disposal system and for pollution of irrigation systems. The goal is to ensure safety of swimming water bodies, set control over use of water from Lake Sevan for industrial purposes, and take preventive measures.

Agriculture. The Land Code of Armenia was added and amended to form more effective mechanisms of agricultural land use practices (January 20). The primary goal of such amendments is to avoid unreasonable withdrawal of land from cultivation, put uncultivated land into crop production and improve land use efficiency. Armenia uses only half of its agricultural land, and the rest of land is abandoned. Currently, the government is drafting regulations to transfer about 150 thousand ha into trust management.

ACBA Bank and the Branch of the German Nature Protection Union (NABU) launched a tender for the "Organic Agriculture Development" program. The winners will get certificates of environmentally safe food producers and be able to improve their prospects for export of organic products.

Armenian farmers will get subsidies for winter crop seeds. The government allocates 329 million drams to subsidize 70 drams of 1 kg of winter wheat to solve the problem of poor quality seeds.

Energy. The Armenian government has approved the Strategic Program for Energy Development until 2040 and the related Roadmap. The key areas for energy development include: maximization of renewable energy; energy conservation; life extension of the

Armenian Nuclear Power Plant; full implementation of the North-South energy transit corridor; and, gradual liberalization of the national energy market.

Ecology. The 2021-2030 National Action Plan of the Republic of Armenia was approved on April 22. The plan is drafted in line with the "green" economy principle compatible with the SDGs reflected in the country's goals of socio-economic development. The overall goal is to reduce greenhouse gas emissions by a maximum of 2.07 t of CO₂ per capita by 2050 and achieve a 40% cut in emissions by 2030 as compared to 1990.

Green financing. As a result of cooperation between Acba bank, ACBA Leasing and the Green Economy Financing Facilities (GEFF) Program of EBRD, some **US\$5 million** will be distributed for the development of the 'green economy' in Armenia through financing business projects in such areas as energy efficiency, climate change adaptation and renewable energy sources.

Green Climate Fund in Armenia is financing two national programs for modernization and improvement of building energy efficiency totaling US\$ 30 million. Additionally, four assistance programs are under development for a total amount of US\$ 4.2 million.

Azerbaijan

Water resources. The 2020-2022 Action Plan provides for the construction of new ten reservoirs in the country. Reconstruction of 22 irrigation canals has started also. At present, Azerbaijan has about 43 agro-parks on the total area of 200 thousand ha, with over 60 thousand ha of new irrigated land. Moreover, 74% of water produced in Azerbaijan is used by agriculture, where water losses reach 30%. In this context, the government is considering a proposal to subsidize farmers for more efficient water use.

Additional US\$ 4.7 million were allocated for the construction of irrigation systems on 10 thousand ha in three country's regions. The irrigation systems will be created as part of the state agricultural development program in Azerbaijan.

Water supply and sanitation. Azerbaijani authorities have approved a twofold increase in water supply prices. The **tariff for water** for the population in the cities of Baku, Sumgait, Khyrdalan and the Apsheron District of Azerbaijan has been doubled since February 1 and is set at 0.7 manats (US\$ 0.41) per 1 cubic meter of water. The water distribution company OJSC "Azersu" explained this rise in prices by a growing number of customers. Additionally, the price of wastewater disposal services has also increased twofold from 0.15 manats (US\$ 0.09) to 0.3 manats (US\$ 0.18) per 1 cubic meter.

Energy. The Khudaferin and Gyz Galasy hydropower plants on the Araz River on the Azerbaijan-Iran border are to be completed by 2024. By present, the dams of the total capacity over 1.6 billion m³ have been completed. The potential generation at these stations is expected to be 280 MW, including 200 MW by Khudaferin and 80 MW by Gyz Galasy. Azerbaijan will benefit from 358 million kWh of hydropower generated

yearly, improved irrigation on 252 thousand ha and new irrigation of 12 thousand ha.

A number of new power stations were put into operation in Karabakh in 2021. 23 power stations and substations of the national energy company, ZAO "Azere-energy" were built or reconstructed and put into operation. The 2018-2021 rehabilitation program ended on September 3 with the capital repair of the Sumgayit power station and commissioning of a pumping station. The Gyulebird hydropower station and Sugovushan-1 and -2 small hydropower stations have been inaugurated after reconstruction and Kelbadjar-1 small hydropower station has been completed.

Environment. In Azerbaijan, the total desertification area reaches 3.7 million ha, of which about 170 thousand ha are to be rehabilitated by 2030. In 2021, 1 million trees were planted.

In line with the decree, which amends Azerbaijan's Administrative Offence Code, import, production and use of disposable plastic dishes have been prohibited. Violators will face confiscation of goods and fines.

Three regions in the north-west region of Azerbaijan – Zagatala, Gakh and Balakan – will be selected and registered under the Globally Important Agricultural Heritage System (GIAHS) with FAO's support. GIAHS are aesthetic sites that combine agricultural biodiversity, resilient ecosystems and valuable cultural heritage. Registration of the regions as **GIAHS areas** underlines their great importance for protection of 42 country's ecosystems, for the food security, ensuring the livelihood of the population, as well as for rural development through eco- and agro-tourism.

International cooperation. A jubilee event on the occasion of the 50th years of sharing Araz and Mil'-Mugan reservoirs on the Araz River was held on May 31. The Azerbaijani and Irani sides underlined the importance of developing regional cooperation for sharing 1.35 billion m³ Araz reservoir operated since 1971 and the Araz hydropower and Mil'-Mugan reservoir ensuring irrigation of 400 thousand ha within the both countries.

Representatives of the Azeri Ministry of Ecology and Natural Resources and the Turkish Ministry of Agriculture and Forestry met in March to exchange on forest protection, water management, climate change mitigation, hydrometeorology, etc. The parties also signed the two-year Work Program on implementation of the Memorandum of Cooperation in Meteorology and Forestry (2021-2023).

Georgia

Irrigation infrastructure. In 2021, the government planned to channel US\$ 39.4 million to development of irrigation infrastructure, for rehabilitation of which more than US\$ 121.2 million had been already invested since 2012. As part of the 2020 bailout plan, the farmers' debt for irrigation services accumulated over 2012-2019 (almost US\$ 2.4 million) has been written off and about 35 thousand farms have been exempted from charges for irrigation services of up to 10 ha of their agricultural land.

With **grant funding** from the EU and UNDP and RDA, the agrocompany “Bioras” installed 60 solar panels and 24 batteries at its agriculture plot to supply a walnut garden and a vegetable greenhouse with renewable energy. OOO “Bioras” owns 22 ha of land in Tetritskaro municipality.

Water supply. Up to US\$ 196 thousand will be allocated by the “Georgian Water and Power” and “Rustavi Water Company” for replacement and modernization of water supply infrastructure in three cities – Tbilisi, Rustavi, and Mtskheta – in 2021–2023. Meanwhile, water tariffs have risen for the residents of these cities since January 1, 2021.

Agriculture. In 2021, the Government of Georgia presented its Agricultural Development Strategy for the period until 2030. The Strategy includes an increase in agricultural good export up to US\$ 3 billion a year; expansion of crop acreage up to 500 thousand ha; building of greenhouse facilities on 500 ha; construction of up to 400 livestock and poultry farms; irrigation of 227 thousand ha of agricultural land; application of best European technologies for air, water and soil pollution reduction; and, an increase in the share of protected land to 17% of the total country territory.

Energy. The construction of Namakhvani HPP in Rioni Gorge which should be the second largest hydro-power plant after Inguri HPP has halted after protests of local population. The protestors said that they would protest until the government cancels the contract with the Turkish contractor “ENKA” and the Contractor leaves the gorge. Despite the government and the company have assured that the construction of such an important structure would be in line with all safety standards, local residents feared that the project would change microclimate, intensify seismic processes and, eventually, lead to environmental catastrophe in the region.

Inguri HPP in Western Georgia represents one of the most fascinating examples of civil engineering achievements of the 20th century. The arched dam has got the certificate of the Cultural Routes of the Council of Europe program. The dam, which is 271.5 m high and 728 m long, is among the world’s five largest arched dams. In 2015, the dam has got the status of cultural heritage site.

Ecology. Adopted in 2021 a draft Law on Environmental Liability contains provisions for environmental damage in line with the “polluter pays” principle. According to the Law, if significant damage is caused to the environment as a result of the activities of a company, the latter will be obliged to remedy the situation. Remedial measures will primarily focus on restoring the damaged environment to its original state or close to it. The fines paid by the companies will be directed to a special Environmental Damage Fund. Georgia will become the first among the EaP countries to create such a Fund.

Source: www.newsgeorgia.ge

A new Forest Code has become effective in Georgia in 2021. The country hosts 2.7 million ha of forests accounting for 40% of the total country area. According

to the Code, all forests will be registered and grouped depending on type of ownership and categories. There will be public, municipal and private forests, which will fall to one of the following categories: protected, protective, resort and economic ones. The category of forest will be determined by its function and impact on the ecosystem.

By 2030, Georgia should become the leading ecotouristic country in the region. The government signed a 10-year Ecotourism Development Strategy, which underlined the importance of ecotourism and the development of green economy. The Strategy sets goals and actions for 2021–2023 to be implemented by the National Tourism Administration together with other agencies. The developed online platform for agro-tourism (agrogate.world) brings together different agro-touristic sites of Georgia, Azerbaijan and Armenia.

International cooperation. The British company “NIAB” and the Georgian Agricultural Research Center has signed an agreement for joint research in the area of plant cultivation and food security. Activities will include organization of joint conferences and workshops, exchanges of students and agronomists, and exchange of information on crop yields and their resistance to diseases and drought.

Belarus

Water resources. In 2021, the Pripyat Basin Council approved a Pripyat Basin Management Plan (PBMA) for the period from 2021 to 2030. Among others, PBMA includes measures for environmental improvement of surface water bodies in the Pripyat River Basin.

The Council of Ministers approved a National Water Management Strategy until 2030 on February 22, 2022. The Strategy was developed for the context of climate change in line with the Belarus Socio-Economic Development Program 2021–2025. The Ministry of Natural Resources and Environmental Protection will be responsible for monitoring the implementation of the Strategy.

The first **Map of Dams** was developed in Belarus based on satellite images and reservoir reference book. Belarusian researchers are creating a hydrological model of the actual status of the Pripyat River within the “Middle Pripyat” nature reserve. At present stage, the researchers assess the state of river and its tributaries in different seasons to identify current problems the Polesye faces due to global warming and land reclamation. Next stage – modeling the river in case of construction of E40 waterway – will show how dams and river cut-off would impact the river and biodiversity. The collected stuff can be used for environmental impact assessment of the project.

Agriculture. In January–November 2021, the exports of Belarusian food products and agricultural raw materials increased by 16% compared to the same period in 2020 and reached more than US\$ 6.03 billion. According to the Belarusian Ministry of Agriculture and Food, foreign exchange earnings increased by US\$ 832 million – a record compared to annual figures

in previous years. Belarusian food products were delivered to 106 countries in January-November.

The 2021-2025 Agrarian Business State Program was approved in 2021. It aims to increase the competitiveness of agricultural products and foodstuffs, increase export potential, and develop environmentally safe agriculture. The program includes sub-programs for crop production, seed production, livestock and breeding, fishery, land reclamation, anti-flood engineering measures, small farm support, etc. Over the five-year period it is planned to improve agricultural production through the introduction of resource-saving technologies. As a result, exports of food products and agricultural raw materials in 2025 are projected to increase by 21.3% as compared to 2020.

Energy. The wind energy project implemented since 2015 by the Ministry of Nature together with UNDP and GEF was concluded in 2021. As part of the project, the Atlas of Wind Potential of Belarus and the Insolation Map showing the areas where SES can be installed have been completely re-evaluated and updated.

According to the Department of Energy Efficiency at the Belarus State Standardization Committee, the capacity of RES installations in Belarus will reach 630 MW by 2025. At the moment, there are about 500 MW of RES facilities, including 82 FES, 53 HPPs, 30 biogas complexes, over 100 electric power plants and 10 mini-CHPs on wood fuel. All this allows lowering the consumption of traditional energy sources and also reducing CO₂ emissions. By 2025, the share of RES should reach 8%.

Green economy. A 2021-2025 National Action Plan for Green Economy was approved on December 10. The priority development areas include, among others: sustainable consumption and production; circular economy; organic production; smart and energy efficient cities; green financing. Information and education campaigns and scientific grounding for transition to green economy were planned also.

Ecology. The State Environmental Protection and Sustainable Nature Use Program was approved for the period of 2021-2025 on February 19. The Program includes subprograms on hydrometeorology, persistent organic pollutant management, biological and landscape diversity conservation, environmental monitoring and protection, and the "Subsoil of Belarus". Among the tasks for the five-year period are increasing the mineral resource base, introduction of modern hydrometeorological observation technologies, climate mitigation and adaptation, preservation and restoration of ecological systems, and ensuring rational use of natural resources. It is also envisaged to develop Management Plans for the Neman and Western Dvina basins.

The Belorussian Hunting and Fishing Society organized traditional spring cleaning campaign "Clean water body", where almost 5,000 citizens participated. About 1.3 thousand km of coastal line was cleaned and over 880 m³ of garbage was collected. The least amount of garbage was collected in water bodies of Brest and Mogilev regions, while most of all – in Grodno and Minsk regions (April 16-24).

International cooperation. Belarus and Moldova intend to expand cooperation in the agro-industrial sphere, namely increase mutual deliveries of agricultural products and food, cooperate in veterinary, phytosanitary, seed production (create hybrids of Belarusian and Moldovan seeds), organize training and professional development of Moldovan specialists in agrarian universities.

Moldova

Water resources. According to the Ministry of Environment, the Ukraine-built Dniester hydropower project is already having a devastating effect on the flow, water quality and biological diversity of the Dniester River. The Dniester is the main source of drinking water for almost 8 million people in Ukraine and Moldova. Since these conclusions are not recognized by the Ukrainian side, international experts will be invited for the project's impact assessment.

During the third meeting of the Commission on Sustainable Use and Protection of the Dniester River between Ukraine and Moldova, the parties agreed on a procedure document for developing management plans and a schedule for synchronizing national management plans for the Dniester river basin. It is planned to develop new regulations for joint monitoring and information exchange in the basin. Additionally, the parties addressed the issues related to safety of tailings ponds in the Dniester basin. The fourth meeting of the Commission is to be held in autumn 2022 in Ukraine.

Water supply. An agreement was signed between the Ministry of Finance of Moldova and the Germany Development Bank for a €10 million grant to expand water services by connecting five villages to the Chisinau-Straseni-Calarasi water pipeline.

Agriculture. The Ministry of Agriculture and Food Industry of Moldova (MAIA) has devised a [draft Strategy](#) for the Development of Agriculture and Rural Areas for 2022-2027.

In 2021, Moldova registered the highest agricultural production growth over 30 years. Production by farms of different categories has been roughly increased by 49.9% as compared to 2020. The growth comes from 75.5% rise in crop production.

FAO launched a new project on mainstreaming climate change adaptation into the country's national planning processes for reduced vulnerability to climate change at local and central levels. The US\$ 685 thousand activity is to be implemented in partnership with the Ministry of Agriculture, Regional Development and Environment and financially supported by the Green Climate Fund (GCF).

Energy. The work has begun on the construction of a 2.8 MW photovoltaic park worth €3.7 million in Criuleni. The initiative is part of projects financed by the Government of China under the Agreement on Technical and Economic Cooperation between Moldova and the People's Republic of China signed in 2011.

The Center of Excellence for Energy Efficiency was opened with EU funding in the village of Festelica in Stefan Voda district. The center includes ten types of demonstration sub-projects in the field of energy efficiency and RES: smart street lighting, photovoltaic park, grid panels, biomass boilers, and solar collectors. Thus, this site has become the first "smart energy" village.

Ecology. Moldova will take part in a new WB regional program for combating marine and river pollution in the Black Sea Basin – "Blueing the Black Sea", which is to be launched in the second half of 2021. Meanwhile, relevant consultations with member countries were held on the Program.

A new US\$ 1.66 million project "Enabling a policy environment for integrated natural resources management and implementation of an integrated approach to achieve land degradation neutrality in Moldova" was launched in March. Financed by the Global Environmental Facility (GEF) and implemented by FAO in partnership with the Ministry of Agriculture, Regional Development and Environment, the three-year effort will improve the provision of *ecosystem services* from the local landscape, elicit behavioral change and support learning in 32 northeastern villages using integrated natural resource management for pilot regions and, ultimately, paving the way to achieving land degradation neutrality and improvement to livelihoods all over the country.

Russia

Water resources. The Federal Agency for Water Resources (Rosvodresursy) launched a digital platform prototype "Water Data". The portal contains an Interactive map of water and hydrological situation in the territory of Russia. With this map it is possible to trace online the information about unfavorable natural phenomena and emergency situations.

Commissioners from Russia, Norway and Finland signed on February 17 the Protocol of water regime regulation in Finnish Lake Inari, resources of which are used by Russian and Norwegian hydropower plants in the framework of the 1959 Trilateral Agreement. The parties have discussed the issues of joint water use, defined the optimal modes of HPP operation and agreed on the schedule of water releases in 2021. To improve information exchange and precision of water regulation, the partners have launched the IBA project (cooperation in the Baltic Sea, the Barents Sea and the Arctic). The Finnish Environmental Institute with the involvement of Russian and Norwegian power engineers will develop a hydrological information bank and a hydrological model of the Paz River basin, covering the entire catchment area of the Paz River.

The scientific expedition to the Volga River organized in summer 2020 by the "One can't do without rivers" Foundation has been summed up. The members passed across almost the whole Volga – 3.5 thousand kilometers. The main conclusions are as follows: (1) water in the Volga does not meet the standards anywhere; (2) Volgograd is the dirtiest city on the Volga, increasing pollution of the river by 50%; (3) Volgo-

grad is the leader in pollution of the river by microplastics; (4) the Volga has less microplastics than the Thames, but more than the Huang He river; (5) the main cause of the Volga pollution is human activity. The expedition's members believe that a large-scale modernization of sewage treatment plants and storm sewers in the cities is needed in order to restore the Volga.

23.9 million rubles were allocated for the construction of water sluices in the lower reaches of the Volga as part of the National Ecology Program's Federal project "Revitalization of the Volga". Thus, the construction of sluices in the Volga-Akhtuba floodplain in Volgograd region can be accelerated to pass floodwater through the whole hydrographic network of the floodplain and prevent water outflow after the end of flood. This will improve filling of rivers and lakes and increase quality of water supply to residents and agricultural producers.

On October 12, during the first meeting of the Working Group on Don River development and improvement, the participants noted that the Russian regions adjacent to the river additionally needed more than 16 billion rubles for implementation of the National Ecology Program; also the Implementation Plan to the relevant Roadmap was discussed. An extensive list of activities was prepared by the Ministry of Natural Resources of Russia and the Rosvodresursy Agency in 2021. The Agency will deal with the improvement of river water availability and of flowage in 13 Don constituent territories. A major overhaul of waterworks facilities is also planned.

Agriculture. The information on agricultural land will be aggregated in the Single State Register (according to the Draft Law adopted on December 21). The Register will become a source of information for land supervision, as well as a resource containing the data confirmed by state land monitoring on the actual use of land plots and agricultural land. Thus, the Russian Ministry of Agriculture will be provided with information on the condition and use of agricultural land.

The draft Federal Law "On Agricultural Products, Raw Materials and Foodstuffs with Improved Characteristics" has been submitted to the State Duma. Its implementation will increase the availability of food products with improved characteristics for the population and help to improve the competitiveness of domestic agro-industrial sector products. The law establishes the concept of improved characteristics and defines the criteria for both the relevant products and their producers. In particular, the document contains the basic requirements for the production, storage, transportation and sale of such products, and provides for a voluntary procedure for confirming compliance with standardization documents.

Energy. The Russian Government allocated 9 billion rubles for hydrogen energy development, in particular, for creation of competitive domestic technologies for hydrogen production, transportation and storage, development of testing grounds for hydrogen energy technologies, including those in Antarctica. In order to implement the tasks set, the Government approved the Hydrogen Energy Concept, which defines the

tasks and strategic initiatives and governs the development of the industry in the medium- and long-term.

In 2021, the share of RES in the Russia's energy system grew to 1.6% by capacity and 0.5% by generation. The installed capacity of RES increased by 1,241.79 MW (45%) amounting to 3,996 MW by January 1, 2022. During the year, 232.9 MW (+13.5%) of solar generation was added, with the total capacity of solar power plants reaching 1,960.6 MW. The wind power capacity increased by 98.3% (1,008.89 MW) reaching 2,035.4 MW.

Water supply. New requirements to the quality of drinking water have come into force since March 1. The permissible concentrations of aluminum and iron used for water clarification were cut, and the permissible content of chloroform in water was reduced threefold; the level of silicon of utility to human body was doubled. A new indicator – the total organic carbon – was introduced. And the concept of technical water suitable for irrigation and unsuitable for drinking was formalized. Meanwhile, the Russian Association of Water Supply and Sanitation believes that the water industry is not technically ready for the new norms yet.

Ecology. With a pledge to plant almost 83,000 new trees, Moscow became the first city in Russia to officially commit to the global UN campaign for **greening the cities**¹⁰⁵. Over 20 cities from 16 countries already pledged to expand their tree cover and improve the management of their urban trees and forests. These include Ashgabat (Turkmenistan), Chisinau (Moldova), Tbilisi (Georgia).

The State Duma passed a Law on free access to environmental information. The following list of data will become open: conditions and pollution of the environment, including conditions and pollution of the atmospheric air, surface water, soil; situation with radiation; stationary sources; the level, volume/weight of emissions; discharge of pollutants; waste management; and, measures taken to reduce the negative impact on the environment.

“Green” laws in 2021. Amendments to the Law on Specially Protected Natural Areas became effective in 2021. The authorities will be able to include in the list of such natural areas the settlements, without withdrawing land plots from the rightholders (if it does not contradict with the regime of SPNAs or if it is not a state nature reserve). According to amendments to the Law on Environmental Protection, by 2024 all organizations involved in geological exploration, extraction, production, transportation, storage and sale of hydrocarbons will be required to approve plans for the prevention and elimination of oil and petroleum product spills. A new methodology for developing norms of permissible discharges into water has been introduced for water user organizations which have a negative impact on the environment. The previously ratified Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer has come into force. The Decree of the Russian Government on

maximum permissible emissions into the atmosphere has come into force as well. The updated forest fire safety rules became effective in January.

International cooperation. For the first time after a five-year break, the tenth meeting of the Russian-Chinese Joint Commission for Rational Use and Protection of Transboundary Waters was held on December 23. At the meeting, the parties adopted additions and amendments to the Program of hydrological information exchange on water bodies in the Amur River basin and approved the schedule of water discharge measurement in transboundary water bodies, when state border needed to be crossed.

On November 16, during the 5th meeting of the Joint Russian-Abkhazian Commission for Protection and Rational Use of Transboundary Water Bodies, the Monitoring Program of transboundary water quality and the Plan of joint actions on prevention and elimination of dangerous consequences of floods and other negative impacts of the Psou River were approved. The riparian countries are going to develop a procedure for joint environmental impact assessment in a transboundary context when planning relevant measures.

Ukraine

Water resources. Irrigation and drainage functions were transferred from the State Water Agency (Gosvodagentstvo) to the reconstituted Ministry of Agrarian Policy and Food. The new Development Concept is to improve water resources management and make it aimed at achieving environmental goals and improving water conditions and flood protection. The State Water Agency, in turn, shall approve rules and regulate operation regimes of reservoirs and waterways and water use in the context of climate change and low-water.

The Verkhovna Rada has adopted the draft Law on amendments to the Water Code of Ukraine in part of clarification of the list of primary water users. The aims of the document are to put on legal grounds the issue of compulsory conclusion of a contract between primary water users and water suppliers; secure in the legislation the provision of paid services related to water supply to legal entities and individuals from irrigation systems and water sources for watering irrigated or drained land, for industrial and municipal needs, as well as for watering gardens, orchards and rain-fed land and filling ponds; conserve and restore state property in strategic sites of Ukraine through paid services. The amendments to the Water Code should provide revenues to the budget of water management organizations.

The Hydrometeorological Service of Ukraine celebrated its 100th anniversary on November 19. Exactly 100 years ago, the Council of People's Commissars of Ukraine established the Central Ukrainian Meteorological Service – Ukrmet. Since 2011, the functions of the hydrometeorological service have been carried out

¹⁰⁵ The Trees in Cities Challenge was launched during the Climate Summit in 2019. The aim is to make the world's megacities greener by planting 11 million trees.

by the Department of Hydrometeorology at the Ministry of Emergency Situations, which later became the State Emergency Service.

Almost hundred rivers have disappeared in Ukraine over the past 25 years. The country may face the acute lack of clean water as early as by 2050. According to the chairman of the State Ecological Inspectorate, not only climate change and river drying, but also violations of environmental law, such as pollution and littering of rivers and unsound water use will be the main causes of drinking water shortage. In 2021, additionally to industrial and agricultural pollution, residues of medicines used in coronavirus treatment were found in water basins in Ukraine.

Agriculture. The Resolution approving model statutes of agricultural cooperatives – the founding documents regulating their activity – was adopted on March 3. The model statutes contain, in particular, provisions that regulate legal status, rights, obligations and relations of members and associated members of a cooperative in part of establishment, governance, running business and termination of agricultural cooperatives. It was noted that the Resolution was drafted to implement the Ukrainian agricultural cooperation law, which abolished division of agricultural cooperatives into production and service categories.

The Program of agricultural development as part of the "National Economic Strategy-2030" Project was presented to the government on February 16. The Program addresses liberalization of the land market, development of irrigation systems, encouragement of production with added value, and opening of new markets. The Program also provides for developments in the area of international food security, introduction of agricultural insurance, support for irrigation, organic production, livestock breeding and sub-sectoral programs such as potato growing, horticulture, and viticulture.

For better control of soil fertility, the Ukrainian Institute of Soil Protection, a unique institution possessing the databank on the state of soils all over Ukraine, was transferred into the jurisdiction of the Gosgeokadastr. By present, the certification of 19.8 million ha of agricultural land has been completed. In the future, certificates will be available for all land plots in the country. The data on the state of soil will be included in the State Land Cadastre's geo-referenced database, which will be made public.

The state will compensate 25% of the costs of those agricultural producers who have installed or upgraded irrigation systems on their farms. Modernization of the irrigation system in the southern regions of Ukraine will provide an opportunity to increase their yields at least twice and thus contribute to GDP growth and new jobs. In 2021, the subsidies for agrarians under the relevant program were to amount 50 million UAH.

Energy. Ukrhydroenergo has put into commercial operation the fourth 324-MW unit at Dniester PSP. The total installed capacity of the Dnestrovskaya PSP reached 1,296 MW in the generator mode and 1,684 MW in the pump mode. The plant will include seven units with a total capacity of 2,268 MW. This will place it first in Europe and sixth in the world.

According to the 2021 results, the share of electricity production from RES in the Ukrainian energy system rose to 13.4%. Based on the data from the Ministry of Energy on electricity production for the first 11 months of 2021 and the operational data from NEC Ukrenergo for December 2021, the share of electricity production from RES in the energy system and at Ostrov Burshytynska TPP was 12.5 billion kWh, with the total production of 156.6 billion kWh.

Ecology. The basins of the largest rivers – Don, Dniester, and Dnieper – were screened for pollutants for the first time, and a number of pollutants, such as pesticides, industrial chemicals, stimulants, and narcotic drugs, were identified.

On January 12, the Ministry of Environmental Protection and Natural Resources approved amendments to the Methodology for assessing the damage caused by land pollution and contamination as a result of the infringement of environmental legislation. According to these amendments, the compensation will be raised 4-6 times for particularly severe and severe levels of pollution and 2-3 times for medium pollution. The collected money will be used for restoration of damaged land.

The Environmental Information Center "Environmental Space" has been opened at the Chernobyl Nature Reserve. The new center will be engaged in environmental education activities and also will become a place of environmental research initiatives.

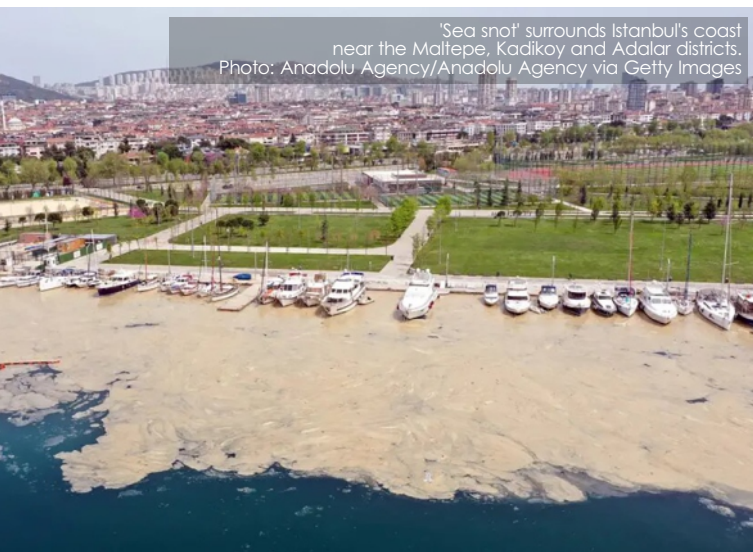
International cooperation. The Western Bug and Sian Basin Water Authority and the Regional Water Authority in Rzeszow, Poland signed a cooperation agreement for the Sian River Basin on February 19. The key areas of cooperation included the exchange of data and information on the status of water resources and related aquatic ecosystems in the Sian basin, the coordination of joint programs, etc. The agreement also provides for joint flood risk management and drought mitigation in the basin.

An extraordinary meeting on transboundary waters among the plenipotentiaries of the governments of Ukraine and Hungary was held on May 19-20. The parties discussed the general matters of transboundary cooperation, the multifaceted environmental issues in the Tisza river basin, and the possibilities for cooperation in educational programs. The work plan for rehabilitation of the transboundary land reclamation system was approved also.

The Ukrainian State Water Agency and the World Wildlife Fund in Ukraine (WWF-Ukraine) signed a Memorandum of Understanding and Cooperation that envisaged joint activities for sustainable, integrated and science-informed water management. The priority areas of cooperation included the advancement of climate adaptation principles into water management practices, including through nature-based solutions; the enhancement of activities on implementation of sustainable IWRM; the organization of joint information events for IWRM; and, the experience sharing.

11.6. Middle East

The phytoplankton is covering Turkey's shorelines in thick, mucus-like discharges that have depleted the nearshore waters of oxygen and killed thousands of fish. Though the outbreaks have occurred periodically throughout history, scientists say their size and frequency in recent years bear the fingerprints of environmental changes that are conducive to algal growth. The buildup of heat-trapping gases in the atmosphere is warming the water as well as the air. And runoff of farm nutrients and untreated wastewater act as growth hormones.



'Sea snot' surrounds Istanbul's coast near the Maltepe, Kadikoy and Adalar districts. Photo: Anadolu Agency/Anadolu Agency via Getty Images

Iraqi water officials say they want to sue their neighbor, Iran. They allege that Iran is reducing water flows to a tributary of the Tigris River. The Tigris cuts through Iraq's capital, Baghdad, and is one of the country's main waterways. The lawsuit would be filed in international court. It also claims that Iran is endangering Iraq's agricultural sector and its drinking water supply. Dams built upstream in Iran and other neighboring countries have limited Iraq's water supply, which is further constricted by severe drought. The ongoing drought was also causing widespread hunger and forcing people to migrate. Half of families in drought-affected regions require food aid and one in five cannot feed everyone in their family. Those numbers were based on surveys of close to 3,000 households across seven provinces in Iraq. The surveys found that in the last six months, about a third of grain farmers have lost over 90 percent of their harvest. The failed harvests are a source of other losses as well. One in fifteen households in the survey had a family member who had migrated for work in the last 30 days. The refugee council warned that unless the rains return, Iraq's outlook for 2022 remains dire.

Hydro-engineering war against nature and people has further escalated in the Tigris River Basin. In 2020 Turkey completed infamous Ilisu Hydropower project, while in early 2021 Iran diverted part of Lesser Zab River to replenish Urmia Lake. Responding to these

external threats the Government of Iraq has re-initiated work in May to expand **Makhoul Dam** on Tigris river to hold additional 3 km³ of water. This threatens the Ashur and Ahwar World Heritage Properties and over one hundred cultural and archaeological sites in and around the city of Sherqat. In this context, the Save the Tigris Campaign sent a letter to the **UNESCO World Heritage Center** expressing civil society concerns and requests to demand the government to make public the Environmental Impact Assessment and clarify what salvage measures for the sites would be implemented.

Iran Water Crisis. Extreme water shortages across southwest Iran have prompted widespread violence from protesters, resulting in two deaths and hundreds more casualties and arrests. As Iran faces its worst drought in five decades, water shortages have left households without access to clean drinking water, devastated the agricultural sector, and led to power blackouts. Protests have been ongoing for months due to mounting discontent surrounding the government's inaction to prevent water and power shortages and the knock-on effect this has had on the economy, with the inflation rate rising to more than 50%.

Jordan and Israel Sign Countries' 'Largest Water Sale' Deal. The two countries agreed that Israel would sell 50 billion liters of water a year to Jordan, doubling what it already supplies. Jordan's cooperation with Israel on water predates their 1994 peace treaty. The additional water Israel will provide will come from the Sea of Galilee. The water deal comes after bilateral relations had cooled under Israel's former Prime Minister Benjamin Netanyahu. Prime Minister Naftali Bennett, who took over in June, has made strengthening ties with Amman a priority.

For the first time the **Syrian reservoir**, which is a major source of irrigation for thousands of area farmers, has dried up in its 27-year history. Ongoing drought seems to be the major source of water scarcity within the reservoir, although managing engineer Maher al-Husseini said damage to the reservoir's main pipeline has also led to significant leaks.

More than 70 percent of **Lebanon's population faces critical water shortages.** More than 4 million people, including 1 million refugees, risk losing access to safe water as economic crisis escalates rapidly and shortages of funding, fuel and supplies affect water pumping. In July, several water establishments announced a state of emergency and began rationing the supply of water from pumping stations and wells. Without electricity to power water pumps and money for maintenance, the public water supply system could collapse. This could increase water costs by 200% a month when securing water from alternative or private water suppliers.

