

# Why is rebuilding the Kakhovka dam not the best option for Ukraine?



Kakhovka forest restoration. Photo: Ivan Moysiienko

On 6 June 2023, retreating Russian troops blew up the Kakhovka dam and hydroelectric power plant structures run by Ukrhydroenergo, a state-owned company, causing the dam to collapse and the reservoir water to rush out. This event has provoked a public debate. State-owned enterprises in the energy sector, inland fishery authorities and contractors willing to carry out reconstruction work support rebuilding of the dam. But all other interested parties either take a ‘wait-and-see’ position or are ready to support the restoration of the natural landscape on the site of the former reservoir. The Agrarian Committee of the Verkhovna Rada of Ukraine has registered a draft law, which prohibits any use of the former Kakhovka reservoir land except for rebuilding of the power plant or establishment of nature protected areas, which shows that parliamentarians consider both options.<sup>1</sup> The Ukrainian government hopes to see the European Bank for Reconstruction and Development (EBRD), a longstanding donor of Ukrhydroenergo, among international financial institutions to finance the power plant reconstruction.

<sup>1</sup> Verkhovna Rada of Ukraine, [Проект Закону про внесення змін до деяких законодавчих актів України щодо створення умов для відновлення Каховського водосховища](#), Verkhovna Rada of Ukraine, 10135-д of 29 January 2024

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The Kakhovka reservoir was created in 1956 as part of the Kakhovka hydropower project located in the arid steppe zone of Ukraine. The reservoir was the largest of the six reservoirs forming the Dnipro cascade and had a volume of 18.19 km<sup>3</sup> (41.5 per cent of the total volume of all six Dnipro River reservoirs).

The dam and the reservoir served multiple purposes – electricity generation, water supply, irrigation, road across the river. The reservoir served as source of water to the city of Kryvyi Rih and irrigation of 5,800 km<sup>2</sup> of agricultural land in southern Ukraine, which is now partly an active war zone and partly occupied by the Russian army. Currently, only the smallest irrigation system (Dnipro-Kryvyi Rih), located on the right bank of the Dnipro, remains on the territory controlled by Ukraine.

The reservoir fed the irrigation system built in 1950-1960 that has been steadily degrading over last three decades, causing massive loss of water on the way to the fields. In 2013, 45 per cent of water was lost due to evaporation and filtration in the North Crimean Canal alone.<sup>2</sup> reflected the Soviet technology of the mid-20<sup>th</sup> century and was created before perceptible climate change and the introduction of environmental standards.

While the Dnipro River currently continues to form the front line in the south of Ukraine, the economy and water supply for local communities are being restored despite the Kakhovka reservoir not existing anymore. In 2023, the Dnipro-Kryvyi Rih canal re-started operations, and by May 2024, the construction of water mains for the Kryvyi Rih and Nikopol districts should be completed.<sup>3</sup>

## A viable alternative: Ecosystem restoration

Almost immediately after the reservoir was drained, the natural restoration process of the vegetation and the riverine landscape started. By the end of 2023, a natural young forest appeared on a large area formerly occupied by water. Based on the ecosystem data from the period before the construction of the Kakhovka reservoir, the former reservoir could accommodate around 340 km<sup>2</sup> of climate-resilient forests,<sup>4</sup> 1,060 km<sup>2</sup> of wetlands (including swampy willow and poplar forests), and 390 km<sup>2</sup> of other terrestrial ecosystems. It would also enable free flowing conditions on the 250 kilometres of the Dnipro River. Given the nature protection status of the territory and absence of extensive agriculture such as grazing and hay production, it can be expected that the area of forests will increase to 890 km<sup>2</sup>. This would make up about half of the already recovering ecosystems, which should be encouraged – not destroyed again – in order to contribute to Ukraine's goals to increase forest cover.<sup>5</sup>

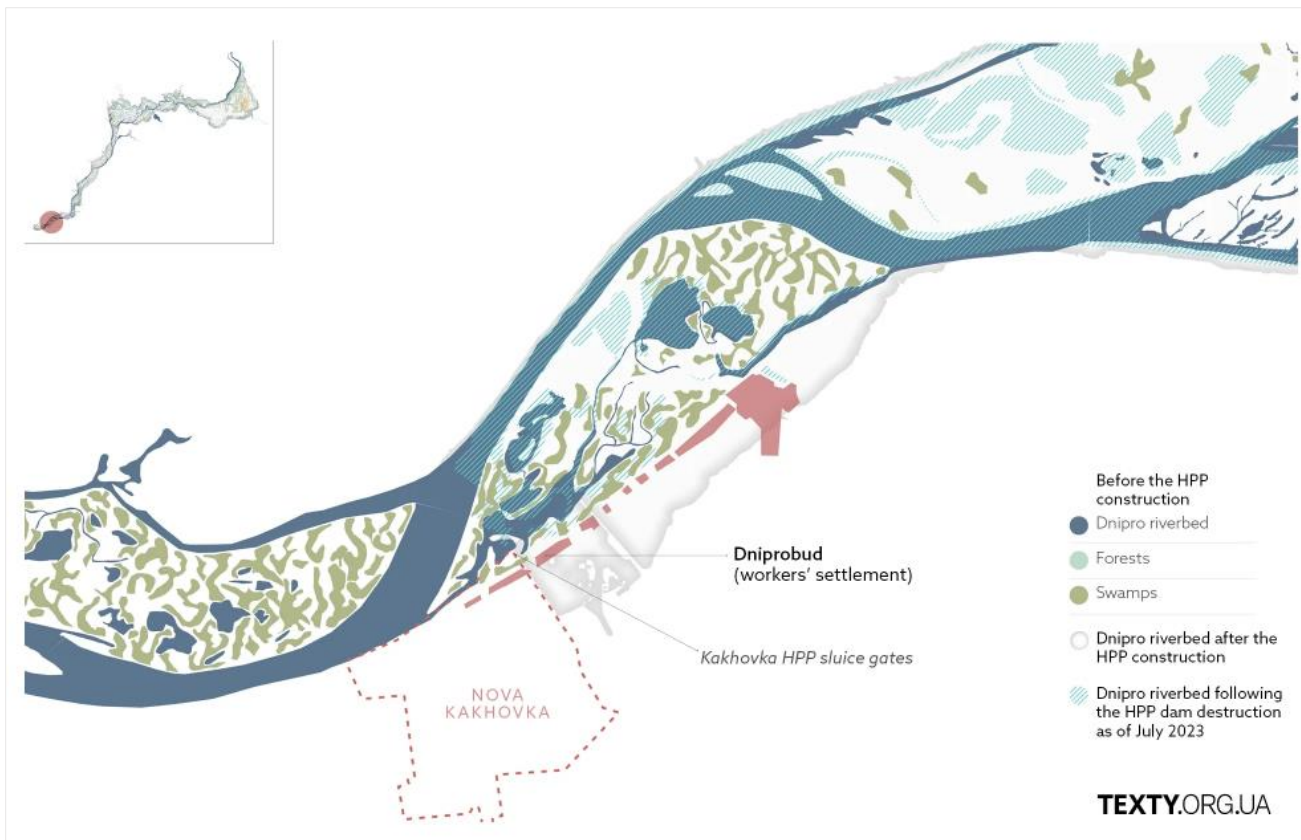
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<sup>2</sup> Republican Committee of the Autonomous Republic of Crimea for Environmental Protection, Report on the state and protection of the environment of the Republic of Crimea in 2013.

<sup>3</sup> Суспільне Дніпро, [Пробний пуск води. У Нікопольському районі Дніпропетровщини триває будівництво водогону](#). Суспільне Дніпро, 28 March 2024.

<sup>4</sup> Alena Havrdová, Jan Douda, Jana Doudová, [Threats, biodiversity drivers and restoration in temperate floodplain forests related to spatial scales - ScienceDirect](#), *Science of The Total Environment*, Volume 854, article 158743, 1 January 2023.

<sup>5</sup> President of Ukraine [Про деякі заходи щодо збереження та відтворення лісів](#), President of Ukraine Decree №228/2021, 7 June 2021.



**Map 1:** Dnipro riverbed before and after the construction of the Kakhovka plant and after its destruction in 2023.<sup>6</sup>

Enabling natural restoration processes of this size (more than 2300 km<sup>2</sup>) will help Ukraine to achieve its nature protection and restoration obligations as part of the EU accession process and would represent the largest nature restoration project ever implemented in Europe. It would represent a decisive contribution of Ukraine to the goals of the EU's Biodiversity Strategy, including the restoration of degraded ecosystems, including restoring the natural flow of rivers.

Restoration will contribute to the conservation of valuable species and especially fish. Before the construction of the Kakhovka dam, migratory fish species, including those of great industrial importance, as well as rare species (*Acipenser gueldenstaedtii*, *Acipenser stellatus*, *Huso huso*, *Alburnus chalcoides*, *Vimba vimba*, *Salmo labrax* and others) moved along the Dnipro. These species can still recover from near extinction on the restored riverbed of the Dnipro upstream to the city of Zaporizhzhia.

Overall, restoration of this area will contribute to the following European and global environmental goals:

The UN sustainable development goals, in particular goals 14.2, 15.1, 15.2 and 15.3,<sup>7</sup> that relate to the need to ensure the preservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems

<sup>6</sup> Texty.org.ua, [Velykyi Luh: Map of the Great Meadow](#), Texty.org.ua, accessed 8 May 2024.

<sup>7</sup> United Nations Department of Economics and Social Affairs, [The 17 goals](#), United Nations Department of Economics and Social Affairs, accessed 25 April 2024.

and their services, in particular forests, wetlands, mountains. In a resolution<sup>8</sup> of 1 March 2019, the UN General Assembly declared 2021–2030 the UN Decade for Ecosystem Restoration to support and expand efforts to prevent, halt and reverse ecosystem degradation worldwide.

In 2021, the Standing Committee of the Bern Convention agreed on the vision statement<sup>9</sup> of the Convention for the period up to 2030, and approved the Strategic Plan,<sup>10</sup> according to which the signatory countries have to *‘increase the area, connectivity, integrity and resilience of natural and semi-natural ecosystems, including through protected areas and other effective area-based conservation measures covering at least 30 per cent of the land...’*

The Kunming-Montreal Global Framework Program on Biodiversity<sup>11</sup> has defined 23 global targets until 2030 (‘Kunming-Montreal 2030 Global Targets’), regarding the conservation of biodiversity, among which by 2030 the signatory countries have to *‘...ensure the effective restoration by 2030 of at least 30 per cent of degraded terrestrial, inland water ecosystems in order to improve the state of biodiversity, ecosystem functions and services, ecological integrity and connectivity; ensure and create conditions so that by 2030 at least 30 percent of land, inland waters important for biodiversity and ecosystem functions and services are effectively conserved and managed...’*

On 27 February 2024, the European Parliament adopted the EU Nature Restoration Law,<sup>12</sup> (still subject to adoption by the European Council) which will establish the norms within which EU member states implement effective restoration measures and sets targets such as *‘...at least 20 per cent of land areas by 2030 and all ecosystems need restoration by 2050.’*

## The role of the development banks in the Dnipro River's future

Following the destruction of the dam, the development banks have indicated their intention to ensure significant loans to Ukrhydroenergo for the reconstruction of the destroyed hydropower facilities upstream from Kakhovka. According to the agreement between the EBRD and the Ukrainian government,<sup>13</sup> signed in June 2023, EUR 200 million in loans and grants from international donors have been secured for the Ukrhydroenergo, as part of the EUR 600 million package. The Memorandum of Understanding between the European Investment Bank (EIB) and the Ukrhydroenergo,<sup>14</sup> signed in March 2024, offers the possibility (not

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<sup>8</sup> United Nations, [United Nations Decade on Ecosystem Restoration \(2021-2030\): resolution / adopted by the General Assembly](#), United Nations 2019, accessed 25 April 2024

<sup>9</sup> Convention on the Conservation of the European Wildlife and Natural Habitats, [Vision for the Bern Convention for the period to 2030](#), *Convention on the Conservation of the European Wildlife and Natural Habitats 2021*, accessed 25 April 2024.

<sup>10</sup> Convention on the Conservation of the European Wildlife and Natural Habitats, [Strategic Plan for the Bern Convention for the period to 2030](#), *Convention on the Conservation of the European Wildlife and Natural Habitats 2023*, accessed 25 April 2024.

<sup>11</sup> Convention on Biological Diversity, [Kunming-Montreal Global Biodiversity Framework](#), *Convention on Biological Diversity 2022*, accessed 25 April 2024

<sup>12</sup> European Parliament, [Nature restoration: Parliament adopts law to restore 20% of EU's land and sea](#), *European Parliament*, 27 February 2024.

<sup>13</sup> European Bank for Reconstruction and Development, [EBRD and Ukraine government to mobilise €600 million for Ukraine energy security](#), *European Bank for Reconstruction and Development*, 2023, accessed 25 April 2024.

<sup>14</sup> European Investment Bank, [EIB President welcomes Prime Minister of Ukraine and endorses agreement to accelerate support and strengthen cooperation in key sectors for the country](#), *European Investment Bank 2024*, accessed 25 April 2024.

approved yet) for an additional loan of EUR 100 million for the rehabilitation and the maintenance of the hydropower system in Ukraine. Further discussions on the loans and grants from the World Bank are ongoing.

Even starting to plan reconstruction of the Kakhovka dam is impossible now as Russian troops control much of the left bank of the Dnipro River, but planning for nature restoration can be supported by development banks right away.

Strategic investments in the renovation of the other Dnipro hydropower plants should include the development and implementation of an environmental flows management plan and, above all, a system of seasonal ecological discharges below the Dnipro plant to support the restoration of biodiversity and ecological functions (services) of natural floodplain river ecosystems. After the destruction of the Kakhovka dam, the restoration of floodplain ecosystems is taking place on a huge area, and it cannot be managed without revising the requirements for the management of ecological runoff and their implementation in the rules for the use of water resources<sup>15</sup> at the Dnipro plant and the entire cascade of other plants on the river.

Instead of investing in the hydropower system as it was, old-fashioned and highly vulnerable to current climate challenges, the development banks should support infrastructure that will adapt regional industry, agriculture and municipal water supplies to the new reality in which the Kakhovka water reservoir does not exist.

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<sup>15</sup> Ministry of Environmental Protection and Natural Resources of Ukraine, [Правила експлуатації водосховищ Дніпровського каскаду](#). Ministry of Environmental Protection and Natural Resources, #210, 27 May 2022.