

Flooding due to the destruction of the Kakhovka Dam

KEY MESSAGES

- 42,000 people are at direct risk of the impact of flooding from the destruction of the Kakhovka Hydroelectric Power Plant (KHPP) (*The Guardian 07/06/2023*).
- As at 9 June, more than 6,200 people have been displaced in both Russian and Ukrainian controlled regions including 2,200 IDPs on the right bank and 4,000 evacuated on the left bank, with no information about their current location (*IOM 8/6/2023; OCHA 8/6/2023; Gov't of Ukraine 9/6/2023*).
- There are an estimated 17,000 people in the critical risk zone on the western right bank of the river in herson oblast (*OCHA 07/06/2023*) and 25,000 people in the Russian-controlled left bank of the Dnipro River. Those living in areas under Russian control cannot access international humanitarian assistance, leaving their lifesaving and humanitarian needs unmet.
- Water supply disruption alone could affect over one million people (*EP 06/06/2023; Kurkul 06/06/2023*) and the destruction of the KHPP could have a long-term socioeconomic impact on the southeastern macro regions affecting up to 1.5 million people (*IA 07/06/2023; Zaxid 07/06/2023*).
- The Ukrainian Government does not have the capacity to respond to all the humanitarian needs resulting from this disaster and requires international support (*KII 07/06/2023 b*).
- People in Kherson city and nearby villages not at direct risk of flooding still need support moving to areas deemed safer because of risks of potential epidemics and service disruption (*Ukrainska Pravda 07/06/2023*).

Aim

This briefing note provides an overview of the disaster, synthesising existing information on the impact of the destruction of the Kakhovka Hydroelectric Power Plant and providing donors and humanitarians information about the potential long-term impacts.

Methodology

The report relies on publicly available information from the media, government statements, and other sources. To complement this information, ACAPS conducted three key informant interviews with experts and coordinated internal information-sharing with other humanitarian organisations.

Limitations

This is a rapid report of the initial and anticipated long-term impact. As the impact is still being assessed, new data will come out during and immediately after the publication of this report. There are significant information gaps on needs in Russian-controlled areas.

Flood affected oblasts as at 8 June 2023



Source: ACAPS using data from Live UA Map (accessed 9/6/2023), OCHA 8/6/2023; ABC 8/6/2023; Reuters 6/6/2023.

CRISIS IMPACT OVERVIEW

On 6 June 2023, an explosion destroyed the KHPP located in southern Kherson oblast. It also breached the adjacent Kakhovka reservoir, causing massive flooding and catastrophic ecological consequences. Flooding had inundated approximately ten nearby settlements by noon of the same day. Overall, 80 settlements are at risk of flooding (Ukrainews 06/06/2023). Ukrainian authorities started evacuations from the ten most affected settlements in this area early on 6 June (Gov't of Ukraine 06/06/2023). As at 8 June, at least one man Mykolayiv oblast had died (Ukrinform 08/06/2023 a).

The eastern left bank of the Dnipro River, which remains under Russian-control, is lower than the western right bank (Gov't of Netherlands 06/06/2023; Topographic Map accessed 07/06/2023). This makes it much more vulnerable to the impact of the dam breach as water is spreading across the left bank's lowlands instead of rushing downwards the river (Slovo i Dilo 06/06/2023). Access to the people in need in areas under Russian controlled is significantly restricted.

There are estimated 25,000 people in the critical risk zone on the Russian-controlled eastern left bank of the river in Kherson oblast. These people are likely heavily affected and stranded, with limited to no access international humanitarian assistance (Ukrinform 06/06/2023 a; NV 06/06/2023). The city of Nova Kakhovka on the Russian-controlled left bank is located just five kilometers from the KHPP. Russian-installed authorities said at least 4,000 people had been evacuated from areas under their control, but no additional information is available on their location or needs (OCHA 08/06/2023). In Oleshky town in Kherson oblast, there have been three reported deaths from flooding (Suspilne 07/06/2023 a). The actual figure is likely higher in the absence of life-saving assistance.

According to Ukraine's national energy company, flooding cut off power for almost 12,000 energy consumers in Ostriv district, Kherson oblast, on the afternoon of 6 June (Fakty 06/06/2023 a). On 7 June, energy disruptions affected up to 20,000 people, mostly in Kherson oblast (EP 07/06/2023). The number of people experiencing energy disruptions in Russian-controlled areas is unknown but could be much higher as they are experiencing worse flooding. In some parts of Kherson city and nearby suburban areas and villages, electricity and gas supply have been cut off to prevent accidents (KII 07/06/2023 b).

ANTICIPATED SCOPE AND SCALE

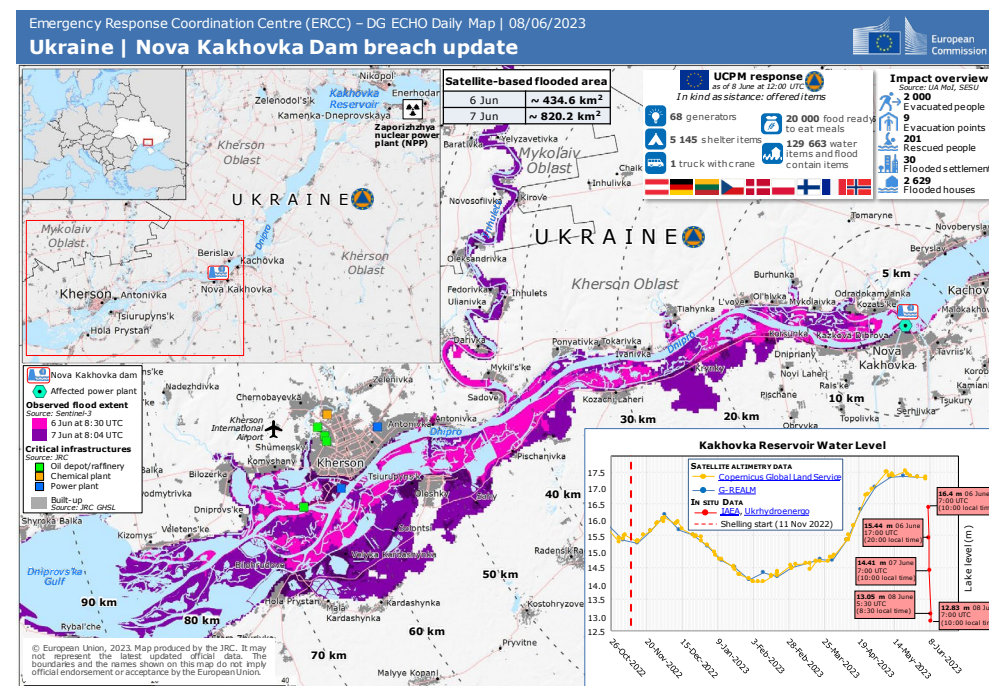
As at 7 June, the destruction of the KHPP had directly affected approximately 42,000. This number includes the 25,000 people living in areas currently under Russian control (Ukrinform 06/06/2023 a; Suspilne 06/06/2023). Of 80 settlements at risk of flooding, 30 localities (including 10 under Russian control) were flooded by 23:00 on 7 June (The Kyiv Independent 08/06/2023; NV 06/06/2023). The flood is expected to last for at least a week (OCHA 08/06/2023).

As at 8:00 of 8 June, the average flood level was 5.6m. More than 2%, or 600km², of Kherson oblast was flooded, with most of the flooding (nearly 70%) occurring on the Russian-controlled eastern left bank (Kherson ODA Telegram 08/06/2023 a). Areas still at risk of flooding include Mykolayiv city and 13 settlements along Inhulets River (Interfax 07/06/2023; Kherson ODA Telegram 08/06/2023 b; KII 07/06/2023 b).

The number of those who will be affected in the long term is expected to be much higher. The disaster could affect between 400,000 and 1.5 million people given the environmental impact of flooding and its influence on the water supply and agriculture (IA 07/06/2023; Zaxid 07/06/2023). Other estimates suggest water supply disruption could affect over one million people as the water inside the reservoir decreases to critical levels (EP 06/06/2023; Kurkul 06/06/2023).

The estimated area covered by the flood surpasses 1,100km² and the strip of entirely flooded land extends from 2.3–23km. The belt of partially flooded areas can reach up to 38km. The flooded areas include 55,000 hectares of forests (Ukrinform 06/06/2023) and the dam's destruction will result in the desertification of 580,000 hectares of agricultural land to which it supplied water, affecting nearly 2% of all Ukrainian farmland (Reuters 07/06/2023; KII 07/06/2023 a).

The areas on the Russian-controlled left side of the Dnipro River will likely suffer eight times more than the right side (Ukrinform 06/06/2023 b).



Source: ECHO 08/06/2023.

HUMANITARIAN NEEDS

Evacuations and life-saving assistance

The number of houses and settlements flooded continues to change, but at least 20 settlements and over 2,600 houses were flooded by 8 June (State Emergency Service of Ukraine 06/06/2023, IOM 08/06/2023)

On the Russian-controlled left bank, there are reports of people stuck on roofs and without access to assistance (Suspilne 07/06/2023). Russia has reportedly prevented some people from evacuating (Politico 07/06/2023). At least three people in Russian controlled areas have died and many more are considered at risk of death because of lack of access to lifesaving assistance. Some people in the most affected Russian-controlled areas asking for lifesaving assistance on social media (Politico 7/6/2023) (KII 08/06/2023a).

People in completely or partially flooded rural areas of Kherson oblast, such as Ivanivka, Prydniprovsk, and Tiahynka villages, are in urgent need of life-saving assistance (KII 08/06/2023 a). This includes older people with mobility issues, people with disabilities and special needs, and children.

Evacuation from the western right bank of Dnipro River started on the same day as the explosion; the State Emergency Services rescued almost 335 people and evacuating nearly 2,000 as at 8 June (State Emergency Service of Ukraine 08/06/2023). Direct evacuations are taking place to Kherson city, Mykolaiv city, Khmelnytskyi, Kropyvnytskyi, Kyiv, and Odesa (Gov't of Ukraine 06/06/2023). Rescuers and volunteers are also saving pets, livestock, and wildlife.

There are people in Kherson city and nearby villages who are not at direct risk of flooding, but there are concerns of potential epidemics and service disruption. These people also require assistance to move to areas deemed safer, especially those with mobility constraints. The Government of Ukraine is the main responder to the life-saving needs resulting from the disaster but has called for international support in the life-saving and evacuation efforts (Ukrainska Pravda 07/06/2023).

WASH

The affected population urgently requires comprehensive WASH assistance. Drinking water (an estimated 100,000 tonnes per day) is the priority need (IOM 07/06/2023). There is a need for 500,000 tonnes of water per day, along with water purification stations, boreholes, disinfectants, toilets, and household chemicals (UCRC 7/6/2023). The flooding also affected sewage services, including many wells and pumping stations (Ukrinform 07/06/2023).

Kakhovka reservoir provided water to much of southern Ukraine, so there is large-scale water supply disruption across several oblasts (VOA 07/06/2023 a), especially the Crimean peninsula which met 85% of its water needs from the dam (Reuters 06/06/2023). People in cities like Kryvyi Rih, which are largely dependent on the water supply from Kakhovka reservoir, are buying drinking water en masse, which is expected to result in a bottled water shortage (BBC 06/06/2023). Authorities are calling for people to limit the use of both drinking and running water in some of the most affected areas (Evgeny Yevtushenko Telegram 07/06/2023).

Shelter

Flooding has affected more than 2,600 houses on the western right bank of the Dnipro River (IOM 08/06/2023). The number of houses affected, and the scale of shelter needs on the eastern Russian-controlled left bank is unknown. Sites for emergency shelter for people newly displaced by flooding has been secured, with local governments in eight oblasts declaring available sites to host evacuees (Ukrinform 06/06/2023 d). It is unclear if there is capacity to provide shelter to more people if displacement numbers increase due to lack of stable access to drinking water, with approximately 400,000 people at risk (IA 07/06/2023).

Health

The contamination of water sources comes with a major health risk. Chemicals and pathogens likely to enter wells and open-water bodies in flooded areas pose a danger of disease and massive death of fish, which has already been observed in Dnipropetrovsk and Mykolaiv regions (New Voice 07/06/2023). Eating infected dead fish poses a high risk of food poisoning, and the Government of Ukraine (GoU) has issued a warning against it (Ministry of Health 07/06/2023). The GoU is stockpiling antibiotics and other medicine for a possible outbreak of intestinal diseases (New Voice 07/06/2023). A cholera outbreak is also being considered (Kyiv Independent 08/06/2023). All hospitals in the affected region of Kherson continue to operate through generators and drinking water supply deliveries (Ministry of Health 06/06/2023).

Cash assistance

Affected people need cash assistance, especially those who lost all their belongings to the flooding (KII 07/06/2023 b). On 7 June, one day after the explosion, over 1,000 families (more than 3,300 people) received cash assistance as part of the emergency response (OCHA 07/06/2023).

HUMANITARIAN CONSTRAINTS

Access

Humanitarian access to the Russian controlled left bank of the Dnipro River is blocked (UN 8/6/2023; Suspilne 7/6/2023; Ukrinform 8/6/2023). The Russian authorities reportedly denied the need for evacuation assistance in Nova Kakhovka and Oleshky cities and other settlements, despite them being among the most flood-affected areas (Hromadske 7/6/2023).

Violence and insecurity

Active shelling continues across the flood-affected territories preventing safe evacuations and safe delivery of life-saving assistance, including in Kherson and Zaporizhzhia regions (General Staff of the Armed Forces of Ukraine Facebook 07/06/2023; Kherson ODA Telegram 08/06/2023 c). The Russian military reportedly prevented people from crossing over from areas under their control and even shot at civilians attempting to do so. It has also been reported that they shot at rescuers trying to reach people in need of life-saving assistance (Suspilne 07/06/2023 b; Ukrinform 06/06/2023 e; General Staff of the Armed Forces of Ukraine Facebook 07/06/2023; KII 08/06/2023 a).

Landmines/unexploded ordnance

There is an increasing danger of the current in inundated areas carrying submerged explosive to other areas (Ukrinform 06/06/2023 f; VOA 07/06/2023 b). Reports of floating landmines exploding in the flood emerged on the same day as the explosion, and there remains a risk of additional damage and fatalities (The Independent accessed 06/06/2023).

The flood will complicate mine clearance activities. Flood-affected Khersonskiy raion is one of the most severely mine-contaminated areas in the country (OCHA 28/12/2022).

Roads

Completely or partially flooded roads, including rails, complicate or prevent humanitarian access (KII 07/06/2023 b).

Checkpoints

On 7 June, the police set up checkpoints and banned volunteers from going to some flooded villages for security reasons. While some bigger organisations are exempt from the blockage, small volunteer groups may be unlikely to reach the people they want to assist (KII 08/06/2023 a).

Communications

People with no access to electricity cannot recharge their mobile phones and are cut off from communication services (Suspilne 07/06/2023 b).

International support

The Government of Ukraine started responding to the disaster immediately, but this has not been enough to cover the scale of the disaster. The Government has criticised the lack of international presence in rescue and evacuations on the same day as the disaster and being unable to respond to the immediate life-saving needs (Ukrainska Pravda 07/06/2023 a).

Response capacity and aid availability

This is likely limited in Kherson, Mykolaiv, and Odesa oblasts (KII 07/06/2023 b). People with low mobility in partially flooded Kherson city require humanitarians to reach them directly at their homes, but evacuation and aid distribution are only being done from certain points in Kherson city so far.

LONG-TERM IMPACTS

- **Protracted displacement:** people evacuating from the affected areas whose houses have been destroyed will likely experience protracted displacement, and many of them will struggle to find jobs in the specific area of their expertise. As a result, they may become dependent on humanitarian aid and social assistance. The vast majority of the affected population prefers to remain in Kherson city close to their homes (KII 08/06/2023). Over 2,200 people are already displaced, however the number is likely to increase (IOM 8/6/2023).
- **Water supply disruptions** are reported in several oblasts and areas, including Crimea, Dnipropetrovsk, Kherson, and Zaporizhzhia. Cities and settlements, such as Kryvyi Rih (Dnipropetrovsk oblast) and Berdiansk (in the Russian-controlled part of Zaporizhzhia oblast), that depended on Kakhovka reservoir will experience long-term impacts. Both cities relied on Kakhovka reservoir for 70% of their water demand (BBC 06/06/2023). If the water level in the reservoir goes down to less than 14m, the running water supply disruption would affect over 200,000 people. If it goes down to less than 13m, it would affect over one million people (EP 06/06/2023; Kurkul 06/06/2023). Combined with the contamination of water, the dam breach could result in a water crisis.
- **Water contamination:** numerous toxic substances from the decomposition of dead fish, the flooding of areas covered in fertiliser and pesticide, and the inundation of landfills and factories are likely to contaminate the water from the dam (Kurul 06/06/2023). Contamination can endanger up to 100,000 hectares of land (KII 07/06/2023 a). The explosion has also released 150 tonnes of engine oil from the KHPP, with a possibility of a further 130 tonnes



being released into the water (NV 06/06/2023). Drinking water sources have mixed with contaminated floodwater, and the Ukrainian Ministry of Health has issued a warning against using these water sources, as well as any other contaminated products (Ministry of Health Facebook 07/06/2023).

- **Irrigation:** damage to the dam has already resulted in the severe shortage of water needed for agricultural irrigation systems in the southeastern macro region. Nearly 95% of irrigation systems in Kherson, 75% in Zaporizhzhia, and 30% in Dnipropetrovsk oblasts are disrupted (MINAGRO 06/06/2023). Kakhovka reservoir was feeding four major irrigation channels in the southeast; all four are slowly shutting down, which will lead to up to 500,000 hectares of arable land lacking water supply (KII 07/06/2023 a). As a secondary impact of the disaster, the Government of Ukraine might be forced to cut off the water supply from the upper reservoirs on Dnipro River to control the flooding. This will limit the water supply for an additional 2.5 million hectares of arable land in the southeast (KII 07/06/2023 a).
- **Agriculture:** Kherson oblast has the largest area of arable land in Ukraine (up to two million hectares). Prior to the full-scale Russian invasion, it was a main supplier of fruits and vegetables (Kurkul 06/06/2023). 14% of agricultural production and more than 500,000 hectares will be affected for at least five years (Agravery 06/06/2023; Fakty 07/06/2023; Interfax 06/06/2023). Prior to the disaster, Ukraine was planning to conduct the demining of agricultural land in the affected area to restore agricultural activities and support the economy. The disaster has disrupted this plan and complicated any demining strategies.
- **Desertification:** the disruption of irrigation will lead to the desertification of arable land in the southeast. Kherson oblast required the most irrigation prior to the full-scale Russian invasion, with over a billion cubic meters needed in 2018. In comparison, the second-highest irrigation demand was in Zaporizhzhia oblast at over 150 million cubic meters that same year (Kurkul 06/06/2023). The disaster has also led to soil salinisation, sediments, and soil erosion, damaging 200,000 hectares of soil (Fakty 06/06/2023 b; UkrAgroConsult 06/06/2023; KII 07/06/2023).
- **Food security:** Kakhovka reservoir supported year-round crop cultivation and mitigated the risk of crop failure, ensuring a high rate of food production. The irrigation system allowed farmers to diversify crops, including water-intensive crops that would otherwise be challenging to grow. Crop diversification also supported soil quality and nutrition level. The disaster has disrupted food supply chains in the southeastern macro regions. Food processing industries, distribution networks, and markets relying on locally sourced produce will struggle to meet demand. The disruption would lead to increased dependence on external food sources, potentially driving up prices and affecting food affordability and availability for local populations. While Ukraine will be able to meet local demand, decreased global agricultural supply and increased food prices will affect countries prone to food insecurity and relying on imports from Ukraine (Zaborona 06/06/2023). Wheat prices rose by 3% on the global market on the same day as the explosion (Newser 06/06/2023). Agricultural production in Ukraine could shrink by 2% (KII 07/06/2023 a; Reuters 07/06/2023).
- **Housing, land, documentation, and property:** as at 8 June, flooding had inundated over 2600 houses on the right bank of Kherson oblast (IOM 8/6/2023). The loss, damage, and destruction of private and public housing, enterprises, and infrastructure will affect residents, business owners, and the economy for the long term, particularly in the most affected areas of Kherson oblast (Interfax 06/06/2023).
- **Livelihoods, businesses, and industries:** the reservoir was essential for sustaining local livelihoods and supporting the micro economy in the villages and towns around it. Its destruction has so far led to 7,000 people losing their jobs. It has led to livelihood and income loss in the tourism sector, fishing industries, livestock and agricultural activities, and other micro and macro businesses in the region. Farmers and the broader agricultural sector who relied on irrigation from the dam will undergo financial losses from the reduced yield and crop failure. The disaster has also particularly affected the fishing industries in Zaporizhzhia (KII 07/06/2023 a). The reduction of metallurgy production in Marhanets, Nikopol, and Pokrov cities has also already been reported (UNIAN 07/06/2023). The loss of income in the immediate and longer terms will result in prolonged socioeconomic consequences as it leads to reduced investment capacity, limited agricultural expansion, and potential unemployment in rural areas, aggravating socioeconomic vulnerability (MINAGRO 06/06/2023; Eco Action 06/06/2023). Russian control constrains data collection on the left bank, but the impact is likely much higher than on the right bank.
- **Environment and ecology:** the reservoir is vital to the various ecosystems around it. This disaster will result in the loss of biodiversity, with long-term consequences for natural ecological balance. Flooding and contamination affect the ecosystems in the directly hit areas, including the Dnipro Delta, the Black Sea, and one national park listed as a protected area (Slovo i Dilo 06/06/2023). Water levels reaching the critically low level of 12m will result in an ecological catastrophe and destroy regional biodiversity (EP 06/06/2023). Topography changes in the natural features of the affected areas, as a result of flooding, also have the potential to disrupt natural water cycles and rivers. Contaminated water from the Black Sea has also reached the Mediterranean Sea (Slovo i Dilo 06/06/2023).
- **Flora and fauna:** flooding in 80,000 hectares of land has affected various flora and fauna, including protected species (Interfax 06/06/2023 and 06/06/2023). The floods could also bring in invasive flora and fauna from other areas (Kurkul 06/06/2023; UNCG 07/06/2023). The amount of freshwater, as well as waste and pollutants, reaching the Black Sea are also putting its fauna and ecosystems at risk of contamination (MINAGRO 06/06/2023; Eco Action 06/06/2023; Babel 07/06/2023). The flooding of territories has also destroyed various natural habitats, affecting endemic wildlife, including rare species (NV 07/06/2023).
- **Cultural heritage, historical and archeological sites** have been flooded, including a dozen museums. Prospects for heritage preservation, historical research, and tourism in the inundated areas have been affected and will likely result in long-lasting cultural impacts (Interfax 06/06/2023; Ukrainska Pravda 07/06/2023 b).

- **Crimea:** the disaster has resulted in damage to the Crimean ecosystem and infections risks and will likely aggravate the expected drought in 2025 (CTR Center 06/06/2023).
- **Nuclear safety:** Kakhovka reservoir was the main water source of the Zaporizhzhia nuclear power plant (ZNPP), which has been under Russian control since the onset of the full-scale invasion in 2022. If the water level in Kakhovka reservoir goes down to 12.5m, the ZNPP will start relying on the cooling pond at the facility, which is only sustainable for several months, requiring further measures (IAEA 06/06/2023). In the uncertainty of collaboration on the part of the Russian authorities, nuclear safety at the site could be compromised, and there is a need to track the risk of nuclear accident at ZNPP.
- **Reconstruction of the KHPP:** the explosion completely destroyed the KHPP, rendering restoration impossible (UNIAN 06/06/2023). The dam, on the other hand, was not fully destroyed, and restoration could take one to two years should the area become accessible and secure (Zaborona 06/06/2023; CFTS 06/06/2023). The dam will require five years of reconstruction, with the estimated cost reaching up to USD 1 billion (Babel 06/06/2023).
- **Energy:** nearly 130 transformer substations in Kherson oblast were flooded and damaged, and two solar power plants were flooded in Mykolaiv oblast (EP 07/06/2023). Energy supply at the country level has not changed since Russia took control of the KHPP in September 2022 (Osvitoria 06/06/2023).
- **Transportation:** river transportation below the Dnipro hydroelectric power plant in Zaporizhzhia oblast has been suspended (Ukrinform 08/06/2023 c). The change in the landscape of the affected region has made shipping between the Dnipro River and the Black Sea impossible for some years (LIGA 06/06/2023). Roads, bridges, moorings, and protective dams in the lower reaches of the Dnipro River have been destroyed and flooded. The ports in Enerhodar, Kamianka-Dniprovska, and Nikopol cities will not be operational in the foreseeable future (Kurkul 06/06/2023). Commercial transport on Dnipro River had already been halted since the onset of the full-scale Russian invasion in 2022, but even if the area becomes accessible and secure, it will remain halted because of the impact of the disaster (CFTS 06/06/2023). The disaster also affected export infrastructure, including elevators and port terminals, on the Dnipro River (KSE Agrocenter 07/06/2023).
- **Flooding:** the destruction of Kakhovka dam, which regulated the risk of floods, has increased the risk of future flooding in the area (Eco Action 06/06/2023).

AGGRAVATING FACTORS

- **Disease outbreaks** can result from water contamination with chemical pollutants, biological matter, and pathogens of infectious diseases from flooded cemeteries, latrines, and landfills (Eco Action 06/06/2023; Babel 07/06/2023; OCHA 07/06/2023). The disruption of water supply and health services compound this risk, particularly in the inaccessible Russian-controlled areas.
- **Administrative constraints:** a week prior to the explosion at the KHPP, the Russian Government passed a law absolving authorities, including Russian occupation authorities on Ukrainian territory under Russian control, from the responsibility of investigating attacks or accidents, including on hydrotechnical facilities such as the KHPP (The Insider 06/06/2023)
- **Gas pipelines:** damage to gas pipelines from flooding could affect access to energy in the affected areas, particularly in Kherson oblast (Censor 06/06/2023).
- **Energy:** the flooding of energy production infrastructure, including the Kherson thermal power station, could complicate the situation (Fakty 06/06/2023 a; ZN 06/06/2023).
- **Further contamination:** an additional 300 tonnes of engine oil from the KHPP can contaminate the Dnipro River (NV 06/06/2023). According to REACH, 20 industrial facilities in areas at risk of flooding could release substances hazardous to people and the environment.
- **Dry spell:** Kakhovka reservoir mitigated the impact of weather fluctuations, droughts, and irregular rainfall patterns. Combined with high temperatures in the summer, a dry spell can result in the increased evaporation of water from the breached reservoir and damage the planted crops that relied on the water channels connected to it. The disruption to irrigation networks alone could cause an up to 15% reduction of crops in the area exposed to the disaster (KII 07/06/2023 a).

BACKGROUND

The KHPP is located in southern Kherson oblast on the eastern left bank of Dnipro River. It is the sixth and southernmost power plant in the Dnipro River cascade of reservoirs designed to provide water supply, energy, and irrigation to southern Ukraine. It started operating in 1956 (Slovo i Dilo 06/06/2023). The Kakhovka reservoir area was 2,155km². It had a capacity of holding 18 billion cubic meters of water, making it one of the largest in the world. Before the explosion, the KHPP served as an important water-regulating structure controlling the flow of the river and allowing hydroelectric power production with six turbine hydro units (Novyny 06/06/2023; The Guardian 06/06/2023).

Since 1996, the KHPP had undergone a series of restoration phases and electrotechnical, hydraulic, and hydromechanical modernization (Pivden Ukraine 21/12/2021; Slovo i Dilo 06/06/2023).

Kakhovka reservoir was vital to 80% of vegetable and fruit production in Ukraine (The Guardian 06/06/2023). Kherson oblast has the largest area of arable land in Ukraine, with up to two million hectares. Prior to the full-scale Russian invasion, it was one of the main agricultural regions and a significant supplier of fruits and vegetables to the rest of the country (Kurkul 06/06/2023).

Trade-related transportation on Dnipro River had reached a potential of 30 million tonnes of goods per year prior to the Russian invasion in 2022 (CFTS 06/06/2023).

The Russian military took control of the KHPP and dam in February 2022 with the launch of the Russian invasion, reaching it from the Crimean Peninsula (Suspilne 24/02/2022).

In October 2022, the Government of Ukraine requested an international monitoring mission to the KHPP on the basis that the Russian military had mined the power plant to delay or prevent a future Ukrainian counteroffensive (Ukrinform 21/10/2023).

In November 2022, Ukraine's armed forces liberated the right bank of Dnipro River in the western part of Kherson oblast, after which the area became accessible to humanitarians (Live UA Map accessed 06/06/2023).

INFORMATION GAPS

The following information remain unknown given constraints in data collection:

- The actual number of people affected, displaced, fatalities, and people in need of assistance, particularly in Russian-controlled areas.
- The response provided and functionality of services in the Russian-controlled areas.
- Early recovery assessments will be possible when the water level recedes. Fixing damaged housing and critical infrastructure will be a top priority, as well as restoring livelihoods in the affected region. Data gaps will remain in Russian-controlled areas.
- Estimates of the total cost of damage, as well as direct and indirect economic costs, are not available at the time of publication and will not be complete without an assessment of the impact in Russian-controlled areas.