

# BRIEFER

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# WATER WEAPONIZATION: ITS FORMS, ITS USE IN THE RUSSIA–UKRAINE WAR, AND WHAT TO DO ABOUT IT

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## INTRODUCTION

Water has been associated with conflict and cooperation between states since the beginning of recorded history. In ancient Mesopotamia, a conflict over the Euphrates River between two Sumerian cities yielded the world’s first recorded treaty.<sup>1</sup> However, water has just as often been weaponized during conflict—water weaponization being the exploitation of the human need for water, by deliberately rendering it scarce and/ or insecure. During World War Two, for example, the Royal Air Force Squadron 617—nicknamed the “American Dambusters”—conducted “Operation Chastise” to destroy three German-controlled dams in Germany’s industrial core.<sup>2</sup> Two of the three targeted dams, Möhne and Eder, collapsed, significantly damaging hydroelectric infrastructure in the country. This is a classic case of water weaponization, and the practice has continued through to this day—all while climate change continues to place serious stress on water resources. This briefener will highlight the core elements of water weaponization, and then assess its practice in the Russia-Ukraine war to date.

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1 Marwa Daoudy. 2020. Water Weaponization in the Syrian Conflict: Strategies of Domination and Cooperation. *International Affairs*, 96(5).

2 Imperial War Museums. “The Incredible Story of The Dambusters Raid.” Accessed April 24, 2023. <https://www.iwm.org.uk/history/the-incredible-story-of-the-dambusters-raid>.

# CLASSIFYING WATER WEAPONIZATION

In a study assessing the issue in Africa and the Middle East, one of the authors of this briefer, Marcus King, developed a six-category matrix of water weaponization, including Strategic, Tactical, Coercive, Unintentional, Instrument of Psychological Terror, and Instrument of Extortion or Incentivization.<sup>3</sup>

TABLE 1: CATEGORIES OF WATER WEAPONIZATION

Strategic Weaponization	Tactical Weaponization	Coercive Weaponization	Unintentional Weaponization	Instrument of Psychological Terror	Instrument of Extortion or Incentivization
The use of water to destroy large or important areas, targets, populations, or infrastructure	The use of water against targets of strictly military value within the battlespace	The use of water provision to fund territorial administration or weapons acquisition with aspirations of achieving legitimacy	Attempted water weaponization causes collateral damage to the environment or its human component	The use of the threat of denial of access or purposeful contamination of the water supply to create fear among noncombatants	The use of water provision to reward the behavior of subject populations and support legitimacy of the perpetrator

An important finding of the study was that water weaponization is complicated by its compounding effects. The impacts of water weaponization seldom pertain to one category. Instead, water weaponization often drives instability across a variety of categories. For example, strategically targeting a dam may unintentionally flood downstream settlements and destroy ecosystem services. Towns impacted by extreme flooding may subsequently be at risk for water-borne diseases due to poor sanitation. These marginal communities may be more susceptible instruments of extortion if they need to pay insurgents or opposition militaries to relocate. Many of these dynamics are at play in the Russia-Ukraine war.

## WATER WEAPONIZATION AND THE RUSSIA-UKRAINE WAR

The Russian invasion of Ukraine illustrates that water weaponization continues to occur at the state level. Since the 2022 invasion, numerous instances of water contamination, destruction of ecosystem services, and targeting of water infrastructure have occurred - limiting water availability that is essential for basic survival, as well as Ukrainian agriculture and energy systems. Given that Ukraine is often considered the breadbasket of Europe, due to the importance of its exports for regional and global markets, Russian water weaponization in the conflict has driven significant food security consequences both within the country and globally - particularly in the Middle East and North Africa. Disrupted water infrastructure that is critically important for nuclear energy systems has

<sup>3</sup> King, Marcus D. *Weaponizing Water: Water Stress and Islamic Extremist Violence in Africa and the Middle East*, Boulder, USA: Lynne Rienner Publishers, 2023. 203.

also driven significant fears of environmental disasters that could have global consequences. Lastly, while Russia remains the primary aggressor in the conflict and the main facilitator of water weaponization, Ukraine also employed similar tactics of water denial on the Crimea peninsula following Russia’s illegal annexation, and has occasionally used water weaponization in other arenas of its conflict with Russia.

Key instances of water weaponization in the Russia-Ukraine conflict are discussed and mapped below, as per the aforementioned six-category matrix.

TABLE 2: KEY WEAPONIZATION INCIDENTS IN UKRAINE

Actor	Strategic	Tactical	Unintentional	Psychological terrorism
Russia	<ul style="list-style-type: none"> <li>• Draining the Kakhovka Reservoir</li> <li>• Zaporizhzhia meltdown threat</li> </ul>	<ul style="list-style-type: none"> <li>• Kerch Strait Bridge Attack</li> </ul>	<ul style="list-style-type: none"> <li>• Cross Contamination</li> <li>• Rebuilding Costs</li> </ul>	<ul style="list-style-type: none"> <li>• 2022 Siege on Mariupol</li> </ul>
Ukraine	<ul style="list-style-type: none"> <li>• 2014 Blockade of Crimea</li> </ul>	<ul style="list-style-type: none"> <li>• 2022 Flooding of the Demydiv</li> </ul>		

## STRATEGIC WEAPONIZATION: THE USE OF WATER TO DESTROY LARGE OR IMPORTANT AREAS, TARGETS, POPULATIONS, OR INFRASTRUCTURE

Connected to the Dnipro river, the Kakhovka Reservoir in southern Ukraine provides critical water for local populations and crop production. Perhaps more importantly, however, is the Kakhovka Reservoir’s role in cooling the Zaporizhzhia Nuclear Power station—Europe’s largest nuclear power plant. According to Hydroweb, the water level in the reservoir was the lowest it had been in over three decades, hitting 14.1 meters on February 6, 2023.<sup>4</sup> Experts fear that the plant will be endangered if the water level dips below 13.2 meters. In late 2022, Russia began deliberately draining the Kakhovka reservoir, possibly to hinder Ukrainian agricultural production or troop movements, which could induce a nuclear meltdown with catastrophic health implications to surrounding populations, animals and ecosystems.<sup>5</sup> Fear of a meltdown was so significant that UN observers recently visited the plant in March to assess these security vulnerabilities first hand.<sup>6</sup>

4 Brumfiel, Geoff, Connie Hanzhang Jin, Jacob Fenton, Meredith Rizzo, and Julian Hayda. “Russia Is Draining a Massive Ukrainian Reservoir, Endangering a Nuclear Plant.” *NPR*, February 10, 2023, sec. Ukraine invasion — explained. <https://www.npr.org/2023/02/10/1155761686/russia-is-draining-a-massive-ukrainian-reservoir-endangering-a-nuclear-plant>.

5 Brumfiel, Geoff, Connie Hanzhang Jin, Jacob Fenton, Meredith Rizzo, and Julian Hayda. “Russia Is Draining a Massive Ukrainian Reservoir, Endangering a Nuclear Plant.” *NPR*, February 10, 2023, sec. Ukraine invasion — explained. <https://www.npr.org/2023/02/10/1155761686/russia-is-draining-a-massive-ukrainian-reservoir-endangering-a-nuclear-plant>.

6 Bigg, Matthew Mpoke. “U.N. Official Heads to Ukrainian Nuclear Plant as Safety Fears Grow.” *The New York Times*, March 27, 2023, sec. World. <https://www.nytimes.com/2023/03/27/world/europe/un-ukraine-zaporizhzhia-nuclear-plant.html>.

The Nova Kakhovka Dam is another focal point of strategic weaponization. Both Ukraine and Russia have accused each other of planning to breach the dam using explosives. This act would flood much of the area downstream and cause major destruction to both civilian infrastructure and the ecosystem around the Ukrainian region of Kherson. Maxar satellite imagery found new damage to the dam following the Russian retreat from Kherson, but, at the time of writing, it has not been destroyed.<sup>7</sup>

The primary example of Ukrainian strategic water weaponization occurred in 2014 prior to the current stage of the conflict, when Ukraine constructed a dam along the North Crimean Canal.<sup>8</sup> This essentially eliminated all water access to the Russian-controlled Crimean Peninsula and diverted water to Ukraine's Kherson region. This action was designed both to punish Russian aggression and compel a Russian retreat-- a tactic that was clearly unsuccessful. Upon the invasion, Russia destroyed the dam in early 2022 to restore the Northern Crimea Canal water flow.<sup>9</sup>

## TACTICAL WEAPONIZATION: THE USE OF WATER AGAINST TARGETS OF STRICTLY MILITARY VALUE WITHIN THE BATTLESPACE

Tactical water weaponization has also been employed by Russia throughout the war. In October 2022, Russia launched 50 missiles on civilian infrastructure in Kyiv as an intrinsic part of its invasion plan. This attack left 40% of residents without access to water and 270,000 apartments without electricity. The inability to access clean drinking water increases susceptibility to water-borne illnesses and disease. Furthermore, attacks on the electrical grid disrupt civilian sanitation, risking disease outbreaks.<sup>10</sup> Russian attacks on civilian water infrastructure have likely facilitated the spread of highly pathogenic diseases forcing people to live in unsanitary conditions without observing COVID-19 prevention measures.<sup>11</sup>

In another incident from the battlefield in November 2022, retreating Russian forces from the city of Kherson detonated explosives on the Antonovskiy Bridge. This tactical decision severed the primary crossing into Kherson, which made it challenging for Ukrainians to pursue Russians across the Dnipro river. Through eliminating the bridge, Russian forces capitalized on the new geographic environment to impede a Ukrainian advance. The Dnipro river serves as a natural barrier to troop and machinery mobility. As often happens when the water

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7 Reuters. "New Damage to Major Dam near Kherson after Russian Retreat - Maxar Satellite." *Reuters*, November 11, 2022, sec. Europe. <https://www.reuters.com/world/europe/new-damage-major-dam-near-kherson-after-russian-retreat-maxar-satellite-2022-11-11/>.

8 Udasin, Sharon. "How a Ukrainian Dam Played a Key Role in Tensions with Russia." Text. *The Hill* (blog), March 12, 2022. <https://thehill.com/policy/equilibrium-sustainability/597910-how-a-ukrainian-dam-played-a-key-role-in-tensions-with/>.

9 "Water Wars: Drought by the Dnipro, the New Conflict between Russia and Ukraine.," April 7, 2021. <https://www.sdafa.co.uk/water-wars-drought-by-the-dnipro-the-new-conflict-between-russia-and-ukraine>.

10 BBC News. "Ukraine War: Power and Water Supply Hit across Ukraine in 'massive' Russian Missile Strikes," October 31, 2022, sec. Europe. <https://www.bbc.com/news/world-europe-63454230>.

11 Dmytro Chumachenko and Tetyana Chumachenko "Impact of war on the dynamics of COVID-19 in Ukraine" *BJM Global Health*, April 5, 2022 <https://reliefweb.int/report/ukraine/impact-war-dynamics-covid-19-ukraine>.

weapon is wielded, this action was a double-edged sword. While it made a Ukrainian advance nearly impossible, the bridge's destruction also means that it is more challenging for Russians to successfully return to Kherson.<sup>12</sup>

On the Ukrainian side, Ukraine was desperate to slow Russian advancement to Kyiv early in Russia's invasion. In order to disrupt troop mobility, Ukraine intentionally released water into the Demydiv region, causing massive damage to residential and agricultural land. However, the act inhibited the Russian advance to the Ukrainian capital and gave the country time to prepare and rearm.<sup>13</sup> This tactic funneled Russian forces into narrow pathways and forced tanks to different terrain--flooded bogs are impossible to traverse with heavy machinery.<sup>14</sup>

## UNINTENTIONAL WEAPONIZATION: ATTEMPTED WATER WEAPONIZATION CAUSES COLLATERAL DAMAGE TO THE ENVIRONMENT OR ITS HUMAN COMPONENT

It is possible that Russia's deliberate destruction of Ukrainian land and infrastructure will come back to haunt it, especially if they intend to incorporate and administer captured territory. Russia's invasion has devastated Ukrainian forests, farmland, and national parks, leaving an estimated 48 billion euros worth of damage. According to the Ukrainian government the cost to water resources alone is \$1.6 billion, severely limiting access to the population, including in areas Russia currently controls and intends to administer.<sup>15 16</sup>

## INSTRUMENT OF PSYCHOLOGICAL TERROR: THE USE OF THE THREAT OF DENIAL OF ACCESS OR PURPOSEFUL CONTAMINATION OF THE WATER SUPPLY TO CREATE FEAR AMONG NONCOMBATANTS

Russia has also denied access to water to civilian populations as an instrument of terror designed to compel noncombatants to surrender. This strategy was evident in Mariupol where "soldiers shut off local water supply as part of a brutal siege on the city, leaving the trapped population without access to safe drinking

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12 Bing Orland, Olav. "Water Wars: Drought by the Dnipro, the New Conflict between Russia and Ukraine." SDAFA, 2021. <https://www.sdafa.co.uk/water-wars-drought-by-the-dnipro-the-new-conflict-between-russia-and-ukraine>.

13 The New York Times. "They Flooded Their Own Village, and Kept the Russians at Bay," April 27, 2022, sec. World. <https://www.nytimes.com/2022/04/27/world/europe/ukraine-russia-war-flood-infrastructure.html>.

14 The Pacific Institute. "Water Conflict Chronology." Accessed April 24, 2023. <https://www.worldwater.org/conflict/map/>.

15 Guillot, Louise, et. al. "The Environmental Scars of Russia's War in Ukraine." POLITICO (blog), February 21, 2023. <https://www.politico.eu/article/environment-scars-russia-war-ukraine-climate-crisis/>.

16 Guillot, Louise, et. al. "The Environmental Scars of Russia's War in Ukraine." POLITICO (blog), February 21, 2023. <https://www.politico.eu/article/environment-scars-russia-war-ukraine-climate-crisis/>.

water or sanitation.”<sup>17</sup> Since May of 2022, Mariupol has remained under Russian control.<sup>18</sup> In April 2022, Russian forces seized the southern coastal city of Mykolaiv, and satellite imagery revealed that they deliberately destroyed the water pipeline to the city during their occupation. When Ukrainian forces regained control of the city, residents were forced to queue in the street to collect clean drinking water. Residents had access to what is known as “technical water” in their homes, but it was polluted and could not be used for drinking or cooking. The queues were and continue to be dangerous and frightening, as the city remains close to the front line and is often shelled.<sup>19</sup> This contributes to the psychological toll of restricted water access.

## STEMMING THE TIDE OF WATER WEAPONIZATION

### ADAPTING U.S. FOREIGN POLICY

The previous section suggests a better way to understand (i.e. theorize) water weaponization, but tangible solutions to this challenge are urgently needed. As a starting point, the United States should set an example by explicitly forbidding the destruction of civilian water infrastructure in military doctrine.

Other solutions lie with prevention. Local water management decisions and climate conditions play key roles in determining water scarcity, warranting additional investments in resilience to reduce opportunities for water to be weaponized amid conflict and climate change. The United States and other heavy emitters of greenhouse gases have a key role to play in providing climate finance—funding that is mobilized for emissions reduction and climate adaptation projects in lesser developed nations under the provisions of multilateral international climate change agreements such as the Paris Agreement. As it stands this funding is well below targets, with developed countries several years late meeting a longstanding pledge to mobilize \$100 billion annually for the developing world. That sum pales in comparison to what vulnerable countries will ultimately need, and financing to date is weighted in favor of loans and emissions reduction projects rather than grants for adaptation of water and other critical systems. The United States must expand climate financing initiatives to include more adaptation projects involving water in conflict-affected and vulnerable states. Making communities more resilient to water weaponization may help them withstand water targeting attacks by aggressors, as well as make them more adaptable to climate change.

The Global Fragility Act is another U.S. foreign policy vehicle for accomplishing this goal. The act was passed by the U.S. Congress in December 2019 as part of a comprehensive government strategy to mobilize U.S.

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17 Zimmerman, Antonia. “Russia’s War on Water in Ukraine.” *POLITICO* (blog), May 25, 2022. <https://www.politico.eu/article/russias-war-on-water-in-ukraine/>.

18 Zimmerman, Antonia. “Russia’s War on Water in Ukraine.” *POLITICO* (blog), May 25, 2022. <https://www.politico.eu/article/russias-war-on-water-in-ukraine/>.

19 Viktoriia Zhuhan & Nader Ibrahim, “Russia accused of sabotaging Ukraine water pipe to Mykolaiv, BBC News. October 25, 2022, Accessed May 24 at <https://www.bbc.com/news/world-europe-63383605>.

foreign development assistance to stabilize conflict-affected areas and strengthen U.S. capacity to be an effective leader of international efforts preventing extremism and conflict. Implementation of the act should include a heavy emphasis on effective and resilient water resource management.

## ENFORCING AND EXPANDING INTERNATIONAL LAW

International law may also be a useful instrument when national governments, as opposed to subnational actors who do not recognize its jurisdiction, are the main perpetrators of water weaponization. These laws and treaties might include *inter alia* the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), Additional Protocol II of the Geneva Conventions on deliberate destruction of civilian infrastructure, and the Geneva List of Principles on the Protection of Water Infrastructure. One weakness of these agreements is that each instrument has limited signatories and countries with access to large water resources such as Syria, Turkey and China are absent.

While destroying civilian water infrastructure is illegal under international law, the Russian invasion has demonstrated blatant disregard for international conventions. The International Court of Justice (ICJ), a forum for prosecuting war crimes, could be further deployed to disincentivize the destruction of water infrastructure. For example, the ICJ has already issued an arrest warrant for Vladimir Putin for the Russian state's kidnapping and relocation of Ukrainian children to Russia.<sup>20</sup> Following this precedent, Putin could also be referred to the ICJ for the wanton and deliberate destruction of water facilities - acts that should be considered war crimes.

## EXPANDING A RESEARCH AGENDA

Water weaponization has recently begun to appear in the academic literature and discourse around climate security. Most research, including Marcus King's, focuses on water weaponization in the Middle East.<sup>21</sup> Unfortunately, conditions in other regions are becoming ripe for water weaponization as climate change-induced water stress becomes more prevalent. Given that these dynamics are present and highly consequential, there is an urgent need for an expanded research agenda in this space. This would help ensure that policy-makers will better understand the phenomenon, and be better equipped to develop effective preventive and responsive solutions.

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20 International Criminal Court. "Situation in Ukraine: ICC Judges Issue Arrest Warrants against Vladimir Vladimirovich Putin and Maria Alekseyevna Lvova-Belova." Accessed April 24, 2023. <https://www.icc-cpi.int/news/situation-ukraine-icc-judges-issue-arrest-warrants-against-vladimir-vladimirovich-putin-and>.

21 See for example, Daoudy, Marwa. "Water Weaponization in the Syrian Conflict: Strategies of Domination and Cooperation" *International Affairs*, 96, no. 5 (September 1, 2020): 1347–66., King, Marcus DuBois. "The Weaponization of Water in Syria and Iraq." *The Washington Quarterly* 38, no. 4 (October 2, 2015): 153–69. <https://www.tandfonline.com/doi/full/10.1080/0163660X.2015.1125835>, Lossow, Tobias Von. "The Rebirth of Water as a Weapon: IS in Syria and Iraq." *The International Spectator* 51, no. 3 (2016): 82–99



## CONCLUSION

The Russia-Ukraine War is the one of the latest examples of water weaponization involving state actors, and it's not likely to go away any time soon. The best ways to make states more resilient to water insecurity, and thus more resilient to attempts at water weaponization, is to both invest in infrastructure that is adaptive to climate change and other stressors—such as in future post-conflict reconstruction in Ukraine—and build out international legal systems to better regulate and disincentivize the abuse of water resources for political and military aims.

## ABOUT THE AUTHORS

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