Co-funded by the European Union

The International Conference
«European Green Dimensions: Fundamental, Applied, and Industrial Aspects»
5-7 June, 2025

ACCESS TO WATER DURING ARMED CONFLICTS: ENVIRONMENTAL AND HUMANITARIAN CHALLENGES

Oleksandra KOVALSKA, PhD Student,
Petro Mohyla Black Sea National University, Mykolaiv, Ukraine.

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

KEY WORDS

- ARMED CONFLICTS
- CRITICAL INFRASTRUCTURE
- SUSTAINABLE DEVELOPMENT
- WATER SECURITY
- ENVIRONMENTAL SECURITY
- HUMANITARIAN CRISIS

The issue of access to fresh water has emerged as one of the most pressing ecological and humanitarian challenges of the 21st century. At the same time, water is increasingly becoming not only a focal point of geopolitical disputes but also a tool of leverage, a catalyst for conflict, and even a weapon in itself. This phenomenon, known as the “weaponization of water,” is characterized by the deliberate destruction of water infrastructure, the obstruction of access to vital water sources, and the contamination of these sources. Such actions exacerbate existing vulnerabilities and pose severe risks to both human security and ecological stability.

Fresh water accounts for approximately 2.5% of the Earth’s total water resources, with less than 1% directly accessible for human consumption. According to the United Nations, more than 2 billion people worldwide currently lack reliable access to safe drinking water. Projections indicate that by 2050, nearly half of the global population will be living under conditions of water scarcity. This escalating crisis underscores the urgent need for sustainable water management and equitable distribution strategies to ensure water security for all.

IN ARMED CONFLICTS, WATER CAN BE USED AS:

1. Tactical Use of Water:
• Destruction of water infrastructure
• Contamination of water sources

2. Geopolitical Pressure:
• Blockade or diversion of rivers and canals
• Water as a tool of influence in interstate conflicts

3. Socio-humanitarian Impact:
• Depriving civilians of access to drinking water
• Provoking migration and increasing disease incidence

Examples of Water Use as a Tool of Tactical or Strategic Pressure in Armed Conflicts

Country/Region	Event/Situation	Year	Form of Using Water as a Weapon	Consequences
Syria	Contamination of the Ain al-Fijeh spring with fuel oil.	2016	Deprivation of water for millions of residents of Damascus.	Humanitarian crisis, disease outbreaks.
Iraq	Capture of the Mosul Dam.	2014–2017	Control of water supply, flooding of villages.	Mass migration, destruction of infrastructure.
Libya	Interruption of water supply to Tripoli.	2020	Water as a tool of political pressure.	Water shortage for 2 million people.
Israel–Palestine	Restriction of water supply to Gaza.	2021, 2023	Blockade of pipelines.	Humanitarian catastrophe, disease.
Ethiopia–Egypt	Conflict over the Grand Ethiopian Renaissance Dam (GERD) on the Nile.	2020–2023	Strategic water accumulation.	Geopolitical tensions.
Sudan	Destruction of water supply in El-Obeid city.	2023	Intentional destruction of infrastructure.	Cholera outbreak in camps.
Ukraine	WWII (1941): DniproHES dam blown up.	1941	Large-scale flooding of territories.	Environmental catastrophe and humanitarian crisis.
	Demolition of dams and pumping stations at the mouth of the Irpin River (Kyiv Reservoir).	2022	Flooding of territories, contamination of soil and water.	Environmental catastrophe.
	Damage to Dnipro-Mykolaiv water pipeline.	2022	Deprivation of water for residents of Mykolaiv city.	Humanitarian crisis.
	Destruction of Kakhovka HPP.	2023	Large-scale flooding.	Environmental catastrophe, water shortage.

In April 2022, due to shelling, the “Dnipro–Mykolaiv” water pipeline was damaged, which supplied fresh water from the Dnipro River.

Analysis of Drinking Water of Mykolaiv City at the Petro Mohyla Black Sea National University

Parameter	Unit	MAC	XI_1	XI_2	XII	I	II	III	IV	V
Temperature	°C		19.2	10.3	12.7	16.7	18.1	15.3	19.9	21.5
pH		6.5-8.5	7.7	7.2	7.2	7.8	7.5	7.3	7.0	7.1
Alkalinity	mg HCO_3^-/dm³	30	508	200	350	325	160	330	150	285
Calcium Hardness		130	378	441	336	290	4895	n/a	352	377
Sulfates	mg/dm³	250	1230	1830	900	520	525	470	460	535
Sulfides	mg/dm³	0	0	0.03	0.04	0	0.01	0	n/a	n/a
Phosphates	mg/dm³	3.5	0.38	0	0.05	0	0	0	n/a	n/a
Nitrates	mg/dm³	50	0	200	315	38	<30	0	0.73	6.4
Nitrites	mg/dm³	0.5	0.04	0	0.29	0	0	0	n/a	n/a
Iron (total)	mg/dm³	0.2	0.17	0.39	0.28	0.95	1.22	1.15	n/a	n/a
Copper (II)	mg/dm³	0.1	0	0	0	0	0	0	0	0
Metals (II)	mg/dm³		1.4	1.5	1.55	0.63	0.27	0.66	1.56	0.72
Total Chlorine	mg/dm³	1.2	0.03	0	0.16	0.16	0.04	0.41	0.06	
Mineralization	mg/dm³	1000	2230	2300	2240	1040	961	2070	866	988
Aluminum	mg/dm³	0.2	0.06	0.1	0.12	0.04	0.04	0.13	n/a	n/a
Turbidity	NTU	1(3.5)	7	<7	<7	7	10	10	10	7

The water supplied to Mykolaiv's centralized water supply system does not meet the requirements of the State Sanitary Standards and Rules "Hygienic Requirements for Drinking Water Intended for Human Consumption" because its indicators exceed the standards for mineralization, salinity, calcium hardness, and the content of chlorides and sulfates.

The exceedance of hydrochemical indicators has led to:

- difficulties in accessing high-quality drinking water;
- increased corrosion of pipes and damage to plumbing;
- worsening of the population's health (allergies, gastrointestinal diseases);
- significant economic losses (installation of filters, purchase of bottled water);
- damage to aquatic ecosystems;
- pollution of water resources with toxic elements

Sustainable Development Goal No. 6 is aimed at ensuring universal access to safe water, improving water use efficiency, and protecting aquatic ecosystems. However, an analysis of current conflicts shows that:

- millions of people are deprived of access to safe water;
- water supply infrastructure is being destroyed or degraded;
- water resources are becoming a tool of geopolitical pressure;
- the environmental condition of river basins is deteriorating

RECOMMENDATIONS

1. water supply facilities must be recognized as objects of enhanced protection under international law;
2. states should invest in the resilience and protection of critical water infrastructure;
3. international cooperation is needed to ensure the right of every person to safe water—even in times of war.

Achieving Sustainable Development Goal No. 6 is possible only under the conditions of peace, justice, and respect for human rights.

References

1. Gleick, P.H. Water and Conflict: Fresh Water Resources and International Security. International Security. 1993. Vol. 18(1). pp. 79–112.
2. United Nations World Water Development Report 2024: Water for Prosperity and Peace. – Paris: UNESCO, 2024. – 228 p.
3. Stockholm International Water Institute. Water and Conflict – From Technical Intervention to Political Solutions. SIWI Policy Brief. – 2022. – 12 p.
4. International Committee of the Red Cross. Urban Services During Protracted Armed Conflict. – Geneva: ICRC, 2021. – 56 p.
5. Amnesty International. War and Water: How the Destruction of Water Infrastructure Harms Civilians. – Amnesty Briefing, 2023. Retrieved from: https://www.amnesty.org/en/latest/
6. Strokal' V.P., Kovpak A.V. (2022). Vojenni konflikty ta voda: naslidky j ryzyky. Ekologichni nauky. 5 (44), 96-97 https://doi.org/10.32846/2306-9716/2022.eco.5-44.14 [in Ukrainian].
7. Pro zatverdzhennja Derzhavnyh sanitarnyh norm ta pravyl «Gigijenichni vymogy do vody pytnoi', pryznachenoi' dlja spozhyvannja ljudynoju» : Nakaz vid 12 trav. 2010 r. № 400. Retrieved from https://zakon.rada.gov.ua/laws/show/z0452-10#Text [in Ukrainian].
8. Mitryasova O. P. (2022) Ocinjuvannja stanu vodnogo ob’jektu jak umova poperedzhennja ekologichnogo ryzyku. Podolannja ekologichnyh ryzykiv ta zagroz dlja dovkillja v umovah nadzvychajnyh sytuacij // Zbirka materialiv dop. uchasn. I Mizhnarodnoi' nauk.-prakt. konf. Poltava, L'viv (2022), [in Ukrainian].