

# Long-term effects of the war in Ukraine on its ecology and agriculture

Iryna Harkavenko, Olha Nykytenko

*National University of Food Technologies, Kyiv, Ukraine*

**Introduction.** The war in Ukraine has had profound impacts on its ecology and agriculture, with significant consequences for the environment and food security.

**Materials and methods.** Empirical and theoretical methods of scientific research were used in the writing process.

**Results.** The conflict has caused extensive environmental damage, including pollution of rivers and lakes, chemical contamination of air, water and soil, destruction of forests, and rendering large areas of agricultural land unusable due to shelling and landmines. Intense bombardment and shelling have rendered vast areas of farmland unusable, littered with debris, holes, and unexploded ordnances, making it impossible for farmers to cultivate their fields. Landmines and unexploded ordnance have contaminated 30% of the country, posing risks to human health and the environment [1]. Apart from that, the war has disrupted agricultural activities, with farmers unable to tend to their fields and facing challenges such as damaged machinery, infrastructure, and storage facilities. The destruction of the upper fertile layer of the soil, which has been formed for centuries, occurs as a result of explosions of rockets, artillery shells of various types, high-explosive aerial bombs, drones, shells of various types of MLRS, "vacuum" bombs, etc. Soils lose their fertility due to changes in their physical, chemical, and physicochemical properties. War accelerates this process. The destruction of fertile farmland in Ukraine, historically crucial to global food systems, has raised concerns about long-term consequences on agriculture and food production. Additionally, the destruction of the Kakhovka Dam on 6 June 2023 led to the flooding of downstream communities, resulting in the evacuation of populations and a need for humanitarian assistance. The floodwaters carried millions of tons of oil, sediment, pesticides, debris, and chemicals downstream towards the Black Sea, posing a risk of ecological disaster by degrading water quality and contaminating groundwater and farmland. Villages were flooded, roads and irrigation canals were washed away, and crops in fields and orchards were inundated, leading to significant agricultural losses in regions like Kherson and Zaporizhzhia. The loss of irrigation infrastructure has rendered farmland unusable and vulnerable to soil erosion. Apart from that, the loss of the dam's reservoir has dried up once-irrigated farmland, making it more susceptible to arid conditions and dust storms. The agricultural region that depended on the dam for water faces long-term challenges in maintaining productivity and sustaining rural livelihoods.

The disruption of water supply from the dam has affected agricultural production, with fields left uncultivated due to destroyed canals and drained reservoirs. This has led to reduced harvests, impacting food security locally and potentially globally. The destruction of the dam has caused irreversible damage to habitats, wildlife, and ecosystems. The contaminated water and toxic mix released into the environment will have long-lasting effects on biodiversity and natural resources.

**Conclusions.** The environmental impact of the war is expected to be felt for years, affecting water resources, soil quality, and biodiversity. These findings underscore the urgent need for environmental recovery efforts and sustainable agricultural practices in Ukraine to mitigate the long-lasting effects of the war on its ecology and agriculture.

## References

1. Hryhorczuk, D., Levy, B.S., Prodanchuk, M. *et al.* (2024) The environmental health impacts of Russia's war on Ukraine. *J Occup Med Toxicol* 19, 1.