

Foreword



We are pleased to present the 2026 English-language edition of the Hungarian Journal of Hydrology (HK), the official scientific journal of the Hungarian Hydrological Society (MHT). This is the third annual English-language edition of the journal,

reflecting our commitment to sharing Hungarian and international water-related research. The papers published in this volume explore a wide range of water management issues, from the Danube Basin to the Indus River. We are confident that both our international and Hungarian readers will find these contributions informative and inspiring.

This issue presents six research articles covering diverse aspects of water science and management.

Microplastics, defined as plastic particles smaller than 5 mm, have become a major global environmental concern. In *"Riverine Microplastics in the Hungarian Danube: Distribution, Sources, and Characterisation,"* Pegah JAHANPEYMA and Sándor BARANYA investigate microplastic pollution in the Hungarian section of the Danube River. Their results reveal an average microplastic concentration of 0.311 mg/m³, corresponding to 142 particles/m³. The most frequently identified polymers were polystyrene, polyethylene, and polypropylene, occurring mainly as fragments, foam, and flakes. The study also identifies the dominant colours of the particles and provides valuable information for understanding, monitoring, and mitigating microplastic pollution in freshwater ecosystems.

In *"On the Role of Bank Storage in Attenuating Lowland River Floods,"* Gadadhara de Figueiredo FERRAZ and Tamás KRÁMER quantify river-aquifer exchange and evaluate the contribution of bank storage to flood attenuation in the Danube and Tisza Rivers in Hungary using a mechanistic model. Their findings highlight the importance of incorporating groundwater-surface water interactions into flood models to improve flood forecasting and flood risk assessment.

In *"Extreme Precipitation Amounts and Dry Periods in the Hungarian Great Plain (1980–2020): Four Urban Stations,"* Dorottya SZÁM, Kira Erika KÁVÁSSY, Ádám BERGER, and Zsolt HETESI examine long-term changes in precipitation-free periods across the Hungarian Great Plain, with particular attention to the implications of climate change for agriculture. Although the frequency of dry periods increased slightly at some locations, the statistical significance of these trends remained inconclusive. The study also highlights the importance of improving soil water retention, particularly in sandy and saline soils, where reduced moisture availability poses increasing challenges for agricultural productivity.

According to the World Health Organization (WHO), antibiotic resistance is among the most serious global threats to public health. In *"OxiTop Microcosm Model as*

a Possible Tool to Study the Effects of Antibiotic Exposure on the Microbial Community," Dongze JIANG, Yi YANG, Mátyás CSERHÁTI, Balázs KRISZT, and Edit KASZAB investigate the relationship between wastewater load and the biological activity of microbial communities under antibiotic pressure. Their work demonstrates the potential of the OxiTop microcosm model as a valuable tool for studying the environmental impacts of antibiotic contamination.

Transboundary water cooperation has long been recognised as an important contributor to regional stability and peace, particularly for countries such as Hungary. In *"Peacebuilding Through Water Cooperation? Institutional Design and Peace-Relevant Functions in the Indus and Nile Basins,"* Ferenc Miklós SULLIVAN develops a mechanism-oriented framework linking institutional design with peacebuilding functions. The study applies this approach to two internationally significant river basins: the Indus Basin, through the Permanent Indus Commission established under the 1960 Indus Waters Treaty, and the Nile Basin Initiative, established in 1999.

Madagascar's concurrent crises of energy poverty, acute food insecurity, and watershed degradation are structurally interdependent, *"The Water-Energy-Food Nexus in Madagascar: Interdependencies, Cascading Failures, and an Integrated Governance Framework,"* Rovatiana Salema ANDRIANASOLOMAHEFA maps the Water-Energy-Food (WEF) nexus dynamics of Madagascar.

The Hungarian Journal of Hydrology is also committed to supporting the next generation of water professionals. In line with this mission, the YOUTH CORNER section provides talented secondary school students with an opportunity to publish outstanding research. We warmly invite our readers to encourage and support these young researchers. This year's featured paper, prepared for the Hungarian competition of the 2026 Stockholm Junior Water Prize, is *"Water Chestnut (Trapa natans): A Food of Ancient Times or a Bioindicator of the Modern World?"* by Hanna HÁDA, Gábor KONCZ, Katalin JÁMBRIK, and Csaba BERTA. The study investigates the accumulation of metals in water chestnut seeds collected from different locations in Lake Tisza, Hungary. Since aquatic macrophytes can absorb and accumulate pollutants from both water and sediments, they serve as valuable indicators of environmental contamination.

We extend our sincere thanks to the authors, reviewers, and members of the Editorial Board for their dedication and invaluable contributions to this English-language edition. We hope this volume will strengthen international scientific cooperation and promote the exchange of knowledge in the field of water science and management.

Welcome to the 2026 English edition of the Hungarian Journal of Hydrology.

Veronika MAJOR
Editor-in-Chief