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The Mahnitaš Torrent in Croatia as a Historical Link Between Austro-Hungarian Torrent Control and Japanese SABO Engineering

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This study explores the Mahnitaš torrential watercourse near Siverić, Croatia, as a unique case illustrating the convergence of Austro-Hungarian torrent regulation practices and early Japanese SABO engineering.

Mahnitaš, an ephemeral tributary of the Čikola River, drains a steep and relatively small catchment in eastern Šibenik-Knin County and exhibits pronounced torrential behavior, characterized by rapid runoff response and short-duration, high-magnitude flow events during intense rainfall. Intensive industrialization at the beginning of the 20th century substantially increased anthropogenic pressure on the natural environment. Mining activities, widespread deforestation, excavation, and the construction of transport infrastructure significantly modified surface runoff conditions, disrupted natural drainage networks, and increased sediment availability. These changes intensified erosion processes, sediment transport, and peak discharges within the catchment. Consequently, the Mahnitaš torrent evolved into a significant hydrological hazard, posing increasing risks to mining facilities, transport corridors, and nearby settlements, thereby necessitating systematic torrent regulation measures to mitigate flood hazards and sediment-related impacts.

This paper outlines the hydromorphological characteristics of the catchment, reviews historical torrent control measures, and examines the role of check dams in erosion control and sediment management. Special emphasis is placed on the Austro–Japanese exchange of technical knowledge at the beginning of the 20th century, particularly the work of Kitao Moroto, whose documentation of the Mahnitaš torrent provides rare visual and technical evidence of early torrent control practices. The study highlights Mahnitaš as an important historical and technical link in the development of modern sediment disaster prevention and SABO engineering.