DETERMINING THE CAUSE OF SCOURING AT SIX SITES AND EVALUATING MAIN-CHANNEL IMPROVEMENTS IN THE LOWER TONE RIVER

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In the lower Tone River, extensive scouring has occurred at six locations, requiring an investigation into its causes and drastic measures in response. The authors have investigated the cause of this scouring and assessed the effects on this scouring of long years of channel-improvement works—with a focus on increasing the discharge capacity of the lower Tone—in order to elucidate the proper approach to main-channel improvement. Hydrological investigations of the current channel have inadequately assessed factors related to flood control. Therefore, the aim of this paper is also to emphasize the importance of investigating the temporal change in channels caused by improvement works, and to point out the important perspective in riverine environment planning that can be imparted by assessing river-improvement projects from a historical perspective in order to better understand the effects of flood-control projects and to provide valuable input for future projects.

Present example of the lower Tone River showed that the hydraulic assessment of flood-control projects—including computer simulation and the analysis of local data on a project's various stages—could help determine whether the individual stages of a flood-control project were effective or not and, if found to be ineffective, what an effective alternative would be.

Those who plan such projects should carefully investigate river sections to determine the environmental conditions that have existed and types of flooding and other problems that have occurred historically. With this knowledge, they should strive for a project that minimizes environmental impact and strikes and balance between flood control and environmental considerations.

Keywords: Tone River, six scours, river improvement work, riverine environmental planning, historical changes of river, three-dimensional numerical simulation, evaluation of river works

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