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SIMULATION on the Gully Erosion Reduction Ability of Check Dam—A Case Study of Xiliugou Basin

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In order to scientifically understand the effect of the construction of check dams on the erosion dynamic process and the ability to reduce gully erosion in the wind-water cross erosion area, in this study, the Xiliugou Basin, one of the ten tributaries, was taken as the research area, and the differences of flood process, erosion dynamics and energy in gully after the construction of check dams were simulated and quantitatively calculated by coupling the distributed hydrological model MIKE SHE and the one-dimensional hydrodynamic model MIKE 11. The reduction of gully erosion by check dams was also estimated. The results showed that: (1) The check dams decreased the flood peak and flood volume of the outlet section by 40.90% and 35.85%, respectively. (2) The average flow velocity, runoff shear force and runoff power along the main gully of the watershed were dropped by 21.66%, 22.02% and 34.31%, respectively. (3) During the planned operation period of the project, the check dams reduced the amount of gully erosion by 3.31 million tons under the condition of multi-year average precipitation. The construction of check dams has significantly changed the flooding process of Xiliugou Basin, which alleviated the erosion dynamic along the main channel as well as provided effective erosion mitigation effects.