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Evaluation model for watershed sediment management of the Shihmen reservoir in Taiwan

S.-C. Chen , Y.-C. Lai , C.-L. Wang

Department of Soil and Water Conservation, National Chung-Hsing University, Taichung 402, Taiwan, R.O.C. (kunkun@mail.nchu.edu.tw / Fax: +886 4-22853967 / Phone: +886 4-22852411)

Serious siltation of Taiwan's reservoirs has occurred from natural landslides and over-development. Although reservoirs can be dredged to prolong their utility and there are treatments to improve water quality, it is far better to achieve these goals via effective watershed sediment management. In order to assess the effectiveness of reservoirs management plans and watershed conservation work, this study uses the concept of completeness ratio to apply the evaluation model of watershed sediment management in planning and evaluating reservoir conservation; and it should be a practical and convenient method in the future.

The sedimentation records and watershed conservation work of the Shihmen reservoir from 1964 to 2006 are used for analysis. Torrential rains accompanying the typhoon induced severe sediment problems in the Shihmen reservoir. After long-term watershed sediment management, the annual sediment yield in the Shihmen reservoir reduce from 4.0×106m3 to 1.4×106m3. Results of this study reveal an increase in lifespan of the Shihmen reservoir is about 35 years because of the effectiveness of the long-term reservoir management plans and watershed conservation work. We can find the completeness ratio of the Shihmen reservoir is bigger, year by year. We also make use of some diagrams to explain the tendency of variations in completeness ratio over the years, and the relationship between the completeness ratio and the management funds.