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Research on benefit of reservoir flood resources utilization based on the dynamic control of limited water level

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ABSTRACT

With the rapid development of the social economy in China, the utilization of surface water and groundwater can hardly meet all demands of production and living. On the one hand, the shortage of water resources restricts the development of economy and society; On the other hand, flood control and storm drainage are carried out to protect the safety of life and property of people during flood seasons. The phenomenon of the shortage of water and flood also creates opportunities for the utilization of flood resources. As the determination of limited water level is the key for reservoir to keep a balance between impounding and flood control regulation, adjusting it appropriately can make better use of flood water resources. In this paper, based on the determination of the staged design flood, flood routing is carried out under different frequencies of upland water. The dynamic control scheme of limited water level is obtained by the method of comparing. Through the analysis, in the case that the upstream water of reservoir has obvious seasonal change, design flood by stages can be used to calculate the limited water level by stages. According to the transformation rules of local climate and rainfall, the flood season is staged; Based on the flood control standard of engineering, the design flood by stages is calculated. And the initial water level is determined to carry out flood routing for design flood by stages according to the primary operation regulations and rules. Calculation was carried out on the stage design flood respectively. The value of limited water level by stages is selected according to the results of flood routing, which simultaneously satisfy flood control standards of reservoir and downstream at different initial water level. Furthermore, the benefit after performing is calculated by the use of value-added of industry, as well as the method of share coefficient of benefit, which contains industrial water supply, irrigation and living water supply. Shilianghe reservoir is taken as a case study. The results show that the average annual benefit of flood resources utilization can be increased by 41.625 million RMB. The research results will draw some reference to the potential benefit of existing reservoir.

Keywords: Flood routing; Dynamic control of limited water level; Value-added of industry; Methods of share coefficient of benefit; Benefit

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