Study on Countermeasures System of Ecological Flow Guarantee in Weihe River Basin

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Ensuring the ecological flow of the Weihe River is a basic requirement for strengthening water resources management and ecological protection and restoration in Weihe River Basin and is of great significance for ensuring the safety of water resources and ecological safety in Weihe River Basin. This study selects three major control cross-sections of Beidao, Linjiacun, and Huaxian for ecological flow protection research. In this paper, the existing results of the main control cross-sections were summarized, the Tennant method and the most withered month average flow method were applied to analyze and calculate the ecological base flow. Then, the flow data from 1980 to 2016 are applied to analyze the degree of ecological flow guarantee. Based on the changes in the Weihe River runoff and the development of water resources, the rationality and accessibility of the ecological flow were demonstrated, and the ecological base flow indicators of Beidao, Linjiacun and Huaxian cross-sections were comprehensively determined to be 2m$^3$/s, 5m$^3$/s, and 12m$^3$/s, respectively. Furthermore, the current status of ecological security in the Weihe River Basin was analyzed in depth. It is clear that there were problems in the Weihe River Basin, such as strong water demand, the high pressure of water uses for life, production and ecology during dry years, difficult guarantee of ecological flow, incomplete ecological flow guarantee working mechanism, etc. Based on the analysis, the suggestions were proposed from the perspectives of enhancing the organization and leadership, intensifying the unified allocation of water resources in the Weihe River, strengthening the capacity of water regime monitoring, establishing an early warning system for ecological flow, strictly controlling water withdrawal, and reinforcing supervision and assessment. Then the countermeasure system of ecological flow guarantee was established.