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Assessment of water ecological security based on aquatic ecoregions in the Heihe River Basin

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Abstract: The paper selects the Heihe River Basin, one of inland river basins of arid areas in the northwest, as a typical study area, carries out exploration on water ecological safety assessment of the Heihe River Basin. The study aims to promote the protection of aquatic ecosystems of the basin, to carry out aquatic ecological function regionalization of the basin, and to promote water ecological civilization construction of basins in arid regions, and so on. In this study, the Heihe River basin is divided into eight aquatic ecoregions based on GIS. According to the ecological characteristics of the basin, the evaluatuon index system of water basin ecological security is established in the paper, and a comprehensive evaluation model of water ecological safety of the basin is also built by use of pressure-state-respone (PSR) analysis. That the water ecological security features of dirrerent aquatic ecoregions of the Heihe River Basin is evaluated and analyzed in the paper. Studies show that among the eight aquatic ecoregions in the Heihe River Basin, on the whole, from upstream to downstream the consolidated value of the water basin ecological security in general is decreasing constantly changing situation presents. The consolidated value of water is the highest ecological safety Qilian mountains cold desert water conservation water ecological regions. The maximum value of ecological safety is in Qilian mountains cold desert aquatic ecoregion, and the area is relatively abundant water resources, water pollution lightest relatively minimal antheropogenic disturbances related .In addition to the downstream region in the Gobi desert region, those ecoregions with high population density, agriculture and other human activities, which the water ecological security values are relatively low. This shows that the water ecological security of arid inland basin is closely related to its lack of water and harsh natural environment outside, in addition, the external anthropogenic disturbace pressure also plays a certain role.

Key words: Heihe River Basin; aquatic ecoregion; water ecological security; assessment