Implementation of the Environmental Flow Regime in the Improvement of River Environment

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Abstract

Determining environmental flow is one of the most important topics in the integrated management of water resources for managing river health, establishing Sustainable balance in ecological conditions and preserving life of river bound ecosystems. In this regard in this research, environmental flow of the Ghazmahalleh river in Kordkouy city of Golestan Province was calculated and evaluated using hydrological methods to improve the ecological environment, maintaining the natural regime of the flow and protecting the biological diversity of the ecosystem. Statistics required for hydrological calculations used from information of hydrometry station of Ghazmahalleh during 44 year statistical period (1970 to 2016) with mean annual flow of 0.24 m^3/s. Results showed that in order to protect and improve the status of the river at the minimum acceptable bioavailability, FDC Shifting method in management class B with a flow of 0.12 m^3/s (51 Percent mean annual flow) in this study due to the consideration of biodiversity management classes and the proper adaptation of the pattern changes within the year of environmental flow and the mean annual flow, priority to other methods and is most acceptable method for estimating environmental flow. In this research proved, results of Tennant method provide lower than the minimum environmental requirement and using this method with imposing stress on the hydrological system, is an inappropriate choice for estimating minimum flow Ghazmahalleh river to maintain the ecological environment. Also Tessmann, Arkansas methods and DRM estimated very low or very high flows of mean flow river. Certainly, allocation amount of environmental flows to these methods provides several problems for different stakeholders from river flow.

Keywords: Environmental Flow, FDC Shifting, Ghazmahalleh River, Hydrological Methods, Mean Annual Flow.