



A Study on the Impact of Pumping Hyporheic Flow on Gaoping River Watershed

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Due to the inherent topography and climate limitations, freshwater resources storage has long been a central issue in Taiwan. In addition, the extreme climate has increasingly led surface water to radially become turbid after heavy rainfalls. Thus, water shortage in Taiwan needs to be done not only in the dry season but also in the wet season. The resources of hyporheic flow have gradually received scientific attention nowadays, which can be used to ensure the stability of the water resource supply. In Taiwan, the hyporheic flow has become an important alternative water resource for the future. Therefore, the current study is undertaken to investigate how the pumping of hyporheic flow affects surface water and groundwater, as well as what interaction of the water resource amount occurs between each station. The study area is selected to be the Gaoping River Weir, which is the main surface water taken station of the Gaoping River. Some hyporheic flow pumping stations are expected to be built in an upper stream of Gaoping River Weir in a few years later.

We applied the MODFLOW numerical simulation software to establish a hydrogeological model of the Gaoping River watershed and then to simulate the pumping situations of the stations in different scenarios. Our results provide a quantitative analysis of the impact of hyporheic flow pumping on surface water and groundwater, as well as the interaction of water resource amount between each station. Thus, it is able to serve as a physical basis for the proposed pumping amount of each station and the possible joint operation of surface water and groundwater resources in both wet and dry seasons.

Keywords: Hyporheic Flow, Surface Water, Groundwater, Water Resource