Investigating the effect of urban wastewater on water quality in Saqez river using physicochemical factors and quality index

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Abstract

The effect of wastewater from Saqez city on the physicochemical parameters of water in Saqez River was investigated. To do this, four stations, the station of the dam of the Cheraghvis, the station before entry the wastewater into the river, the station after the entry of wastewater into the river; and the station before the river entry to the dam Kazemi dam were selected. The physicochemical parameters of water, including nitrate, phosphate, alkalinity, ammonia, temperature, pH and dissolved oxygen, oxygen demand (BOD) and chemical oxygen demand (COD) were measured every 30 days from August to September 2017. The WQI $_{NSF}$ water quality index was calculated based on the results. The results showed that there was no significant difference between the stations in terms of temperature ($P> 0.05$). The parameters of nitrate, phosphate, alkalinity, ammonia, dissolved oxygen, pH and BOD_5 were significantly influenced by different stations ($P <0.05$), so that the BOD_5 and ammonia values in the effluent stations of Saqez were higher than the threshold for growth of warmwater fish. The highest and lowest levels of BOD_5 in stations 3 and 1 were 12 ± 0.001 and 5.5 ± 0.707 mg L^{-1}, respectively, and the highest (1.16 ± 0.156 mg L^{-1}) and lowest (0.1 ± 0.00 mg L^{-1}) ammonia levels was observed in stations 1 and 4, respectively. Based on the WQI $_{NSF}$ quality index, the first and second stations showed good quality status and the third and fourth stations showed lower (moderate) status. Therefore, given the direct entry of urban wastewater into the river, it is recommended that all these units be equipped with wastewater and wastewater treatment systems to prevent the destruction of natural ecosystems in rivers while exploiting the river.

Keywords: Physicochemical parameters, Saqez River, Waste Water, Water Quality Index (WQI $_{NSF}$).