Assessment of weirs in dissolve oxygen (DO) level in Kor River

H. Fakhraei[1], A. Karimi-Jashni[2]
1- Master of Science in civil and environmental engineering, Shiraz University, Shiraz, Iran
2- Assistant professor, Shiraz University, Shiraz, Iran

habibfa@yahoo.com
akarimi@shirazu.ac.ir

Abstract

Kor River is one of the main rivers in Fars province, Iran. Because the Kor River is polluted as a result of urbanization and industrialization, the biochemical oxygen demand (BOD) concentration was increased. Consequently, dissolve oxygen (DO) was decreased. It is necessary to use versatile water quality models to asses the DO concentration and make policies for pollution control. Several weirs are located along the Kor River to distribute agricultural water to adjecent farms. These weirs enhance reaeration so that DO levels increase along the river. According to the DO profile, there occurs a large decay of DO in the lower half of downstream of Kor river, between 75 and 13 km, caused by the increased discharge of municipal and industrial pollutants.To determine how much weirs affect DO levels, another model without weirs was constructed. It shows an increase of DO deficient regions, located between 79 and 2 km. To improve present situation, three extra weirs added to the existing model. It shows that level of DO, to some extend increased but, would not achieve to standard level, 4 mg/l.

Keywords: Kor River, QUAL2K, dissolve oxygen (DO), weirs.

1. INTRODUCTION

According to the World Health Organization estimated that not too far future water shortage crisis will be one of the most serious human problems. Surface water and rivers are considered as one of the main sources of water supply, but today the drought problems enhance performance of politicians in order to maintain quality of rivers up to standard indexes.

In this paper QUAL2K was chosen as a framework of water quality modeling to simulate Kor River. A tool for the management of the river is generated, aiming at assisting the decisions that will allow a better use of the water resources, as well as predicting improve in amount of oxygen dissolve caused by situated weirs along side Kor River.

2. SITE DESCRIPTION

Kor River is located in north-west of Fars province, Iran. Kor River Originates from the southern heights of the Zagros Mountains, and eventually pours into Tashk and Bakhtegan Lake, after 310Kms. This study covered upper 193 km length of the Kor River (from Doroudzan Dam till Bakhtegan Lake). The river receives several drainages such as Kohesabz, Ahochar, effluent of Shiraz petrochemical complex and Marvdash city sewage. It continues up to Tashk and Bakhtegan Lake (Fig. 1). The altitude of the basin area that covered in this study varies from 1560 to 1623m above mean sea level (Bakhtegan Lake level and Doroudzan Dam level, respectfully). Major pollution sources include domestic sewage, industrial wastewater, livestock discharge, and urban and agricultural runoff [1]. In downstream to intake water from the river and distribute in agricultural lands some weirs had been built such that waterfall increased dissolve oxygen level.