



# Use of the water quality index as a simple pollution indicator for Kor and Sivand Rivers

H. Fakhraei<sup>1</sup>, A. Karimi-Jashni<sup>2</sup>

1- MSc. Student, Civil and Environmental Engineering Department, Shiraz University, Shiraz, Iran

2- Assistant Professor, Civil and Environmental Engineering Department, Shiraz University, Shiraz, Iran

Corresponding Author: [habibfa@yahoo.com](mailto:habibfa@yahoo.com)  
[akarimi@shirazu.ac.ir](mailto:akarimi@shirazu.ac.ir)

## Abstract

In this study spatial and monthly measurements are done along the course of the Kor and Sivand Rivers, encompassing all the parameters needed to quantify the WQI for these rivers. The WQI of the upstream of the Kor River at the dry season is classified as medium, which dwindled in the plains, due to the seepage from the Shiraz petrochemical complex, effluent of municipal wastewater of Marvdasht City, discharges from the Kohesabz and Ahochar Drainages and farm lands. The WQI degrades further to the fair state, during the dry season at the downstream especially where the Sivand River joins the Kor River. Sivand River itself goes with the same trend, having a medium WQI at the upstream, which degrades drastically to fair at its junction with the Kor River.

**Keywords:** Water quality index (WQI), river water pollution, Kor River, Sivand River

## 1. INTRODUCTION

In the study of a natural ecosystem, many variables simultaneously change with time and location with little opportunity to control them all, systematically or otherwise. By measuring as many parameters as possible that define the system, it may be possible to understand their interactions and to assess the sustainability of the environment. Many rivers/streams in the developing countries are heavily polluted due to anthropogenic activities, such as industrial and sewage discharges [1].

Different regions of the world are faced with different types of problems associated with the occurrence, use and control of water resources, which may endanger the sustainable development of these resources. The quality of surface waters is a very sensitive issue. Anthropogenic influences as well as natural processes degrade surface waters and impair their use for drinking, industry, agriculture, recreation and other purposes. Due to the spatial and temporal variations in water chemistry, a monitoring program and a representative and reliable estimation of the quality of surface waters are necessary. The water quality index (WQI) has been considered to give criteria for surface water classification based on the use of standard parameters for water characterization. This index is a mathematical instrument used to transform large quantities of water characterization data into a single number, which represents the water quality level. The use of WQI is a simple practice, which allows adequate classification of water quality [2].

## 2. MATERIALS AND METHODS

### 2.1. DESCRIPTION OF THE WATERSHEDS INVESTIGATED

Fars province is located in the southern half of Iran. Geographically this province is situated between 50° 42' to 55° 36' eastern longitude and 27° 02' to 31° 43' northern latitude. Its surface area equals to 12 million hectares and its center is the city of Shiraz. With respect to divisions of basins by Jamab consulting engineers, 25.5 percent of the area of the province is located in Kor and Sivand basin.[3] The Kor and Sivand River basin is located in a semi-arid region of Fars province (Iran) (Fig. 1) with a mean annual rainfall in the range of 300- 400 mm. The wet season goes from October to April but most of the rainfall occurs during the months of December and January. The rivers drainage area covers approximately 15780 km<sup>2</sup>, while almost 9650 km<sup>2</sup> corresponds to the Kor river drainage area. The Kor River originates from Safid and Shouroshirin Creeks, till it reaches Dorodzan dam storage and flows mainly from north-west to south-east. The river flows