



## **A comparison of surface water quality sampling program using Water Framework Directive in Iran**

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### **Abstract**

When river water quality fluctuates over relatively long periods with respect to the sampling frequency, the collection of samples may be inappropriate for characterizing average water quality. This paper presents the results of a water quality monitoring study carried out on the stretch of the river Siminehroud (western north of Iran) dominated by periodically used for agricultural works near it.

Water Framework Directive (WFD) is also known as the EU directive 2000/60/EC identifies processes for developing and safeguarding the territory through surface water quality trend analysis non-parametric tests characterization. The aim of this study is to describe using relevant examples, the implementation of WFD in Iran, with a discussion of a case study, as well as the role of sampling frequency to river water quality.

The results obtained have allowed a definition of the chemical and physical water quality of the Siminehroud River located in western north Iran as well as its classification according to the main WFD outlines. Sampling frequency studies and non-parametric tests have also been proposed as possible water quality management tools for the application of the EU directive.

**Keywords: water quality index, sampling, trend analysis, water framework directive**

## **1- INTRODUCTION**

Water is the sector with the most comprehensive coverage in EU environmental regulation. EU water directives have brought about considerable changes in national legislative statutes even in those countries with the most developed environmental regulation. The WFD sets out common approaches and goals for the management of water in 31 countries (25 Member State countries and the 9 pre-accession countries which should conform in the long term with Community law). The WFD establishes the goals for the condition of Europe's water and introduces new ways and processes for achieving them. The overall goal is a "good" and non-deteriorating "status" for all waters (surface, underground and coastal). The main tool is organization and planning at a river basin level and identification of pollution-control measures [1]. The WFD sets out clear deadlines for each of the requirements which adds up to an ambitious overall timetable [2]. The objective for surface waters is that of a "good" ecological and chemical quality status. Surface water is defined as being of good ecological quality if there is only slight departure from the biological community that would be expected in conditions of minimal anthropogenic impact. A standard process is provided in the WFD for defining local standards accordingly but in this study we try to do it for Iranian rivers. Quality elements for assessment are divided into biological elements, hydro morphological elements (e.g. quantity and dynamics of flow, river depth and width variation) and supporting physicochemical elements (e.g. thermal/oxygenation conditions, salinity, nutrients, etc.) for rivers, lakes, transitional and artificial/modified waters (those created or resulting due to a physical modification, serving economic activities) [3].

For each element a descriptive definition of a high, good, moderate, poor and bad status is given. Each National authority should set standards for the elements most relevant to the pressures faced by the water body under its