

COMPUTER APPLICATION TO IMPROVE MONITORING OF WATER QUALITY

Ana Ktona^{1*}, Bledar Pepa², Anila Papparisto³, Mehilana Hystuna⁴, Pranvera Lazo⁵

¹Department of Informatics, Natural Science Faculty, Tirana University, Boulevard Zogu I 1, 1001 Tirana, Albania

²Department of Biology, Faculty of Technical and Natural Sciences, Vlora University, Kosova 2, Skela, 9404 Vlora, Albania

³Department of Biology, Natural Science Faculty, Tirana University, Boulevard Zogu I 1, 1001 Tirana, Albania

⁴KreatX, Sami Frasheri 39, 1019 Tirana, Albania

⁵Department of Chemistry, Natural Science Faculty, Tirana University, Boulevard Zogu I 1, 1001 Tirana, Albania

*e-mail: ana.ktona@unitir.edu.al

Abstract

Environmental problems in Albania have been increased during the last decades as the result of the transformations in the urban and rural areas, particularly in industry, construction, and agricultural activities. This process is followed by an increase in the emission level of different pollutants to the environment that are directly affect the quality of water bodies, including the quality of rivers' water. Several studies have been conducted in recent years in Albania to assess and evaluate the water quality of various rivers based on chemical, physical, and biological parameters. An important component of the biological assessments is the study of benthic organisms, diatoms and benthic macro-invertebrates. The data collected from the analysis of benthic macro-invertebrates have been used in this study to determine the biotic indexes (expressed in numerical values), which directly reflect the quality of rivers' water.

This study presents the stages for setting up the BlueQ application for automatic calculation of four biotic indices and its functioning based on current results of the ecological assessment of Shkumbini River. The methodology used to develop the application is a prototype methodology usually used in software development when the requirements are not clear since the beginning for the software building team.

The BlueQ application was build based on the characteristics of river macro-zoobenthos parameters. This application could facilitate the work of young researchers, volunteers, and environmental experts who deal with the bio-ecological study of the rivers. Through this application, an optimization in the time and the quality in the processing of biological data is achieved. The biologists and environmental scientists can add data to the final application, created using the Shkumbini River data, and automatically could monitor and measure the water quality of the rivers of interest.

Many computer applications have already been built by international environmental agencies enabling fast data processing based on benthic macro-invertebrates. Such applications that facilitate data processing and increase the quality of the work for river water quality assessment are lacking in Albania. The BlueQ application is the first application in Albania to support the rapid processing of data on river water quality based on the composition of macro-zoobenthos, which can be used even more widely in the region.

Key words: *Computer application, Prototype methodology, Biotic indices, Water quality.*