



“Gheorghe Asachi” Technical University of Iasi, Romania



LAND BASED SOURCES POLLUTION MANAGEMENT IN A SUB-BASIN CATCHMENT AREA OF A FRESHWATER LAKE: A CASE STUDY

**Kemal Gunes^{1*}, Fabio Masi², Selma Ç. Ayaz¹, Huseyin Tufekci¹,
Mehmet Besiktas¹, Omer Visali Sarikaya¹, Cihangir Aydoner¹**

¹TUBITAK Marmara Research Center, Environment and Cleaner Production Institute, Dr. Zeki Acar Cad. No:1,
Gebze, Kocaeli, 41470 Turkey

²IRIDRA, Via La Marmora 51, 50121 Florence, Italy

Abstract

This study has been conducted in Hoyran, a sub-basin of Lake Egirdir which is the second largest freshwater lake of Turkey. Total population of this sub-basin is approximately 35000 people. Untreated domestic wastewater is discharged into the main drainage channel which passes through sub-basin together with the agricultural return flow. This main drainage channel carries domestic wastewater and agricultural return flow directly to Lake Egirdir. The main purpose of our study is to enable treatment of domestic wastewater and agricultural return flow through sustainable systems. In this study, it has been planned that wastewater of 6 settlement units to be treated through constructed wetland systems which will be built individually. This study aims to treat wastewater of 2 settlement units and agricultural return flow through riverine constructed wetland that is planned to be built inside the main drainage channel. Removal of organic compounds has been taken as basis for treatment systems designed within the scope of this study. In this regard, average Biological Oxygen Demand (BOD₅) values measured at wastewater discharge points of settlement units ranges between 200 and 350 mg/L. Additionally, other parameters which are analyzed in the main drainage channel are Dissolved Oxygen (DO), pH, Electricity Conductivity (EC), Chemical Oxygen Demand (COD), Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS). Average values of these parameters are 2.7; 7.8; 724; 500; 63.2; 12.2; and 174 mg/L, respectively. When these planned systems were constructed, the targeted range of BOD₅ removal rate was 76-99.9%.

Keywords: catchment, freshwater, lake, pollution

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* Author to whom all correspondence should be addressed: e-mail: Kemal.Gunes@tubitak.gov.tr; Phone: +902626772955; Fax: +902626412309