



Tracing organic and inorganic pollution sources of agricultural crops and water resources in Güzelhisar Basin of the Aegean Region – Turkey

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The study area Güzelhisar Basin is 6 km far from the city Aliaga, Aegean Region in Turkey which represents a rather industrialized area having five large iron and steel factories, but also areas of agriculture. Steel industry in Aliaga is causing metal pollution. Around Güzelhisar Basin and nearby, the dominant crop fields are cotton, maize, vegetables, olive trees and vineyards. Güzelhisar stream and dam water is used for irrigation of the agricultural land. Due to contamination from metal industry in Aliaga, organic farming is not allowed in this region. Industrial activities in the region present a threat on sustainable agriculture. The region is a multi-impacted area in terms of several pollutant sources affecting soil and water quality.

The overall objective of the project is to trace back plant nutrients (N, P, K, Ca, Mg, Na, Fe, Mn, Zn, Cu, and B), hazardous substances (i. e. persistent organic pollutants), radionuclides (^{40}K , ^{232}Th , $^{226}\text{Ra}/^{238}\text{U}$), and metal contents (As, Cd, Cr, Co, Cu, Hg, Mn, Ni, Pb, and Zn) by examining the soils, agricultural crops and natural plants from Güzelhisar Basin and water and sediments from Güzelhisar stream and dam. Spatial distribution of pollution will be evaluated by regionalization methods. For this, an advanced analytical methodology will be applied which provides an understanding of sources and occurrence of the respective substances of concern. An innovative multi-tracer approach comprising organic and inorganic marker substances, will identify and quantitatively assess sources and their impact on water pollution and the pollutant pathways in this agricultural crop production system.