

Determination of Erosion Risk in Basin Scale, and Monitoring of Sediment and Organic Carbon Sources by Fingerprinting Technique

Research Area	Sustainable Soil and Water Management
Research Program	Conservation and development of soil and water resources in watersheds
Executive Institute	International Agricultural Research and Training Center
Supporting Institute/s	TAGEM, Ege University. Faculty of Agriculture, Turkish Atomic Energy Authority
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Project Summary:

Erosion is experienced as quite intense under Turkey's topography and climate conditions. For this reason, there have been needed researches which reveal the active sediment sources and participation from these sources with numerical data to detect correctly and to manage of the sediment transport areas in a basin. Many researchers indicate that without specifying the active sediment sources, reducing the sediment load in the stream by high cost physical structures along the canal/river, is not sustainable. In Western part of Turkey, there are also many basins and sub-basins faced with sediment problem where sediment storage dams had constructed. In this context, the Köseler Pond Basin, which is located at the border of Gediz and Bakırçay valleys and which has a sedimentation problem, was chosen as a research area. At the first years of the pond construction, it was faced with sediment problem and some sediment storage dams were built on the stream for the purpose of improvement. However, for the continuity of such physical structures, first of all, soil protection measures should be taken in basins. In this regard, the objective of this study is to determine the size of erosion on the basin scale and the source of transported sediment arriving to the water storage structure by using sediment fingerprint technique. The temporal and spatial aspects of suspended sediment transport by using RUSLE technology will be examined. Thus, it is aimed to determine priority areas in planning appropriate soil protection methods. At the same time, in terms of regional conditions, this study is intended to be a model for other basins with similar characteristics. The steps of applying sediment fingerprint method in the basin stream system will be carried out in the following process: the potential sediment sources in the basin include the collection of soil samples from the farmland, pasture, niches and troughs as well as the creek bed where the sediment is deposited, the rear of the dams and the samples from the pond reservoir area it will be used of mixing model to determine the contribution. Some physical properties of the soil and concentrations of organic and inorganic elements as fingerprint characteristics in determining the source of the sediment in the research basin will be determined. In addition, the ratio of C13 and N15 stable isotopes will be determined and the changes in the ratios in the soil will be looked at. On the other hand, evaluations based on C13 stable isotope analysis will be carried out to monitor the redistribution and storage of C in the basin due to the organic fraction of the sediment.

Key words: Sediment sources, sediment fingerprinting technique, RUSLE, organic carbon, stable isotope