



USDA-CSREES 2006 National Water Quality Conference

A GIS-based erosion modeling in the Latian Dam watershed using RUSLE

Considering the effects of soil erosion in producing dangerous floods, filling the dams quickly, the destruction of farm lands and bad effects on the quality of water resources, it is necessary for every country to have a perfect program for keeping the soil. According to real and factual information considering the point that the LATIAN DAM is one of the important drinking water resources of Tehran, and it also has a role in preventing the flood, it is very important to keep the quality of water and preventing the dam from filling. Therefore, the upstream basins of the dam related to Jajrood River, the Kond River and the Afjeh River were selected for modeling and studying the amount of erosion and its accompanied sediment and phosphorus. Considering the special aspects of RUSLE model, it was used for estimating the amount of erosion in the above mentioned basins.

The results of modeling show that the degree of erosion in this basin is high because of steep slopes, lack of plant coverage and the quality of soil. The reduction of surface plants coverage and pastures because of expanded activities of cattle raising and the change of the landuses have increased the erosion potential. The results of modeling the amount of erosion in Jajrood basins have been estimated about 1,524,511 tons, in Kond basin about 228,470 tons, and in Afjeh basin about 103,117 tons per year.

In order to evaluate the obtained results and the ability of the model, these results were compared with the measured sediment in the entrances of the Dam in the year 2002.

By comparing the amount of sediment in this method, with the measured amount of the sediment, the precision of the modeling results in Roodak Station (The Jajrood River entrance) was 87%, in Najarkola station (Kond) about 86% and in Naroon station (Afjeh) about 55%.

By using the results of the water samples analyses in the flood and measuring the amount of phosphorus, the degree of phosphorus entering the reservoir by the abovementioned rivers were calculated.

Also, the degree of erosion in these basins considering the capability of the lands to be used and using the suitable plant covering in these lands, was modeled and the degree of the reduction of erosion was estimated. Comparing these

results with the present situation of the lands shows 54% reduction in the basin of Roodak, 59% in Kond basin and 75% in Afjeh basin.

This research shows that by using the proper coverage in the basin, the amount of soil erosion due to rainfall and the amount of phosphorus entering the basin, is reduced considerably.

Author: Mehdi Pourabdullah