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Effects of water flow on the erosion processes in the channel of GIS technology

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Abstract: This paper studied sediments on the canal. The process of erosion caused by the water flow in the main canal is determined using GIS. One of the main factors forms erosion of basic sediments in water which the sands on the canal are sediment under the channel. Effective use of water supply for irrigation is calculated at sediment level on flow and depends on erosion processes such as precipitation, field erosion, and run-off.
We can measure the amount of water erosion in the country by mainly studying the water erosions in the canals. The sediments of water flow on the main canal were expressed erosion impact on flow by ArcGIS 9.3.
Keywords: main canal, water erosion, water flow, water use of efficiency.

Introduction. The desert part of our country consists of the main agricultural lands and therefore, it is necessary to determine the demand of the water required for the irrigation over there. It is important to consume water efficiently in the arid regions of the country to minimize the water loss in the country. For the efficient water flow in the irrigation canals we need to study the sediments of the canals. The removing of the sediments also increase the fertility of the agricultural lands as the sediments has some minerals which are not appropriate for the crops. What channels are water flow characteristics of the water resources as well as at the regional groundwater flow is affected. Therefore, a great peninsula is in between of the SW Asia and the Red Sea. It consists of mainly a desert plateau and as a result of it the sand and the tiny particles to the surface come through the irrigation canals and makes up a large share in the sediments in it.

Irrigation and water resources are estimated in the Central Asian rivers, primarily, tiny particles in the water flow to case study. A lot of research works have been done in these regions [1, 2, 6]. The bottom sediment in the case of the Amu-Darya River, well known empirical structure of the ground water shows the importance of studying the particles in the water flow [3, 4, 5, 6].

At the present, we need to improve the irrigation channels by reducing the sediments stored in its basement for the sustainable use of those canals for years. The program ArcGIS 9.3 gives the geographical outline of all the information digitally and also gives good solutions to get new results in this area.

Methodology. Our research area is situated in Kashkadarya region near the 'Mirshikar' canal (Figure 1). It is a subtropical region and the rainfall is around 130 mm. Here, the expulsion of water volume is 25 times more than the rainfalls. The temperature is above +45 °C in summer; also, winter is warm in this region.

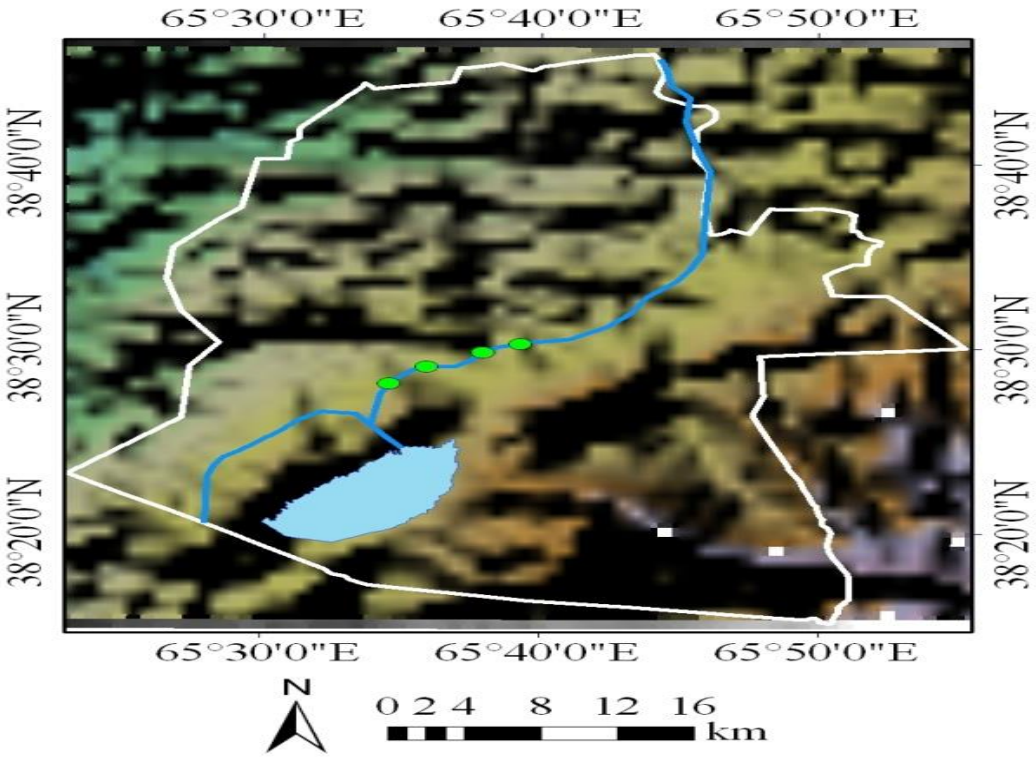

Fig.-1. Subject of inquiry

In the main channel responsible for the erosion process, we use the following method to study the water caused erosion in it. We measure different seasonal sample

and test it in laboratory and do the necessary analysis to measure the particles flow in the channel. The conditions of sand erosion in the study area are modeled using GIS. In this model we use the dataset of the SRTM satellite (Fig-1).

The erosion is a result of the following factors [4,5,6,7]: the climatic elements (temperature, precipitation, wind), soil type, land surface cover (vegetation, open land), impact of the management practices for estimating soil and simplify the expression below:

$$ER_{soil} = R \cdot SL \cdot C \cdot CP \cdot K \qquad \text{ton/ha-year} \qquad (1)$$

Where: R-rain erosion; SL-slope of the land; C-covering of Earth surface; CP-layer of the earth lanthanide elements; K-soil erosion [8,9,10,11].

Rain erosion factor (R) will be calculated from the flow of the rainfall and runoff, based on maximum of 30 minutes disruption in the ground layer. A mathematical statement that the two values are equal:

$$R = 38{,}5 + 0{,}1 \cdot P \qquad (2)$$

Surface slope of the land factor (SL) is determined using the two methods. Firstly, slope of the surface areas of azimuthal component and the slope to the horizontal line[12,13,14,15,16,17,18].

Covering the surface of the land (CP) Landsat artificial satellite GEOKOVER is identified from the information on the basis of classification and soil erosion factor (K) was formed on the basis of a review of literature.

The empirical analysis of this model is calculated by using ArcGIS 9.3.

Results and Discussion. The results we took four samples from the pickets and analyzed the test samples also give the same results. The relationship between the slope and the erosion process is equal to 0,68 of what on the presence of various types less dependence of ground surface.

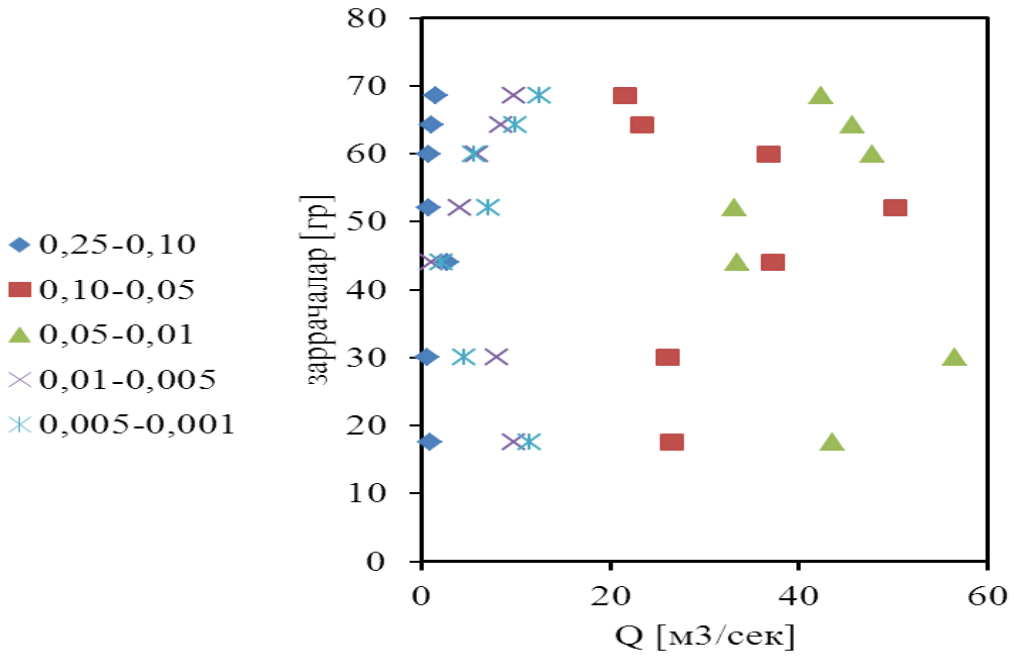

Fig.-3. Studied pickets to be a water particles suspended in water flow

The first part of the main channel of the water concentrations were low dependence particular erosion. That is not only on the basis of the pattern. Sediments in the channels decrease the water flow.

CONCLUSION

The main idea of this paper is to show the potential erosion surface in the Mirshikar area. The particular components were designed for the GIS analysis. The map of the crumble of area which is near to the main channel is made by GIS also. According to the results obtained in this region the potential erosion surface was average 9,2 tons square kilometer in the field. As a result, the channel will share a constant flow of the water and can cause a number of complications. This process to carry out further research is needed. According to the results of the main channel at the top of the thread is not related to the consumption of the water.

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