

Abstract:

Surveying physical and chemical features of suspended sediments is an important topic in river engineering studies. One specific consequence of soil erosion is the sedimentation's intra-regional and extra-regional impacts on the basin. It is of high importance to accurately estimate the suspended load of sediments carried by a river and explore the physical and chemical features of suspended sediments. Sediment characteristics of a river are the main drivers of water projects such as dam construction, flood control, and recreational uses. The present research surveyed the physical and chemical features of suspended sediments of Sistan River in Hydrometric Station of Kouhak Dam during 2016-2017 water year. Overall, 22,788,432 cubic meters of water and 4116.12 tons of sediment were transported through Sistan River during the water year. A total number of 56 samples—13 samples on monthly basis—in various depth conditions of the flow were collected and hydrometric experiments were performed. Grading curves of suspended sediments were then drawn. Next, chemical properties of the suspended sediments were studied focusing on the Nitrite, Nitrate, Phosphorus, and Potassium. Results revealed that Clay particles constitute 13.81% of the sediments and 86.19% of the sediment type is Silt. It was also found that the size of suspended sediment particles varies between 0.001 and 0.06 mm and the average D50 equals 0.225mm with standard deviation of 0.005. The results of chemical experiments showed that the average Nitrogen pollution of the sediments in suspended sediments and in the flow were equal to 0.15 mg/l and 0.61, respectively. The average Phosphorus pollution in suspended sediments and in the flow was 1.2 mg/l and 1.06 mg/l, respectively. The average Potassium pollution in suspended sediments and in the flow was respectively 12.5 mg/l and 13.2 mg/l. According to the obtained results, Nitrogen and Phosphorus pollutions were minimal and at acceptable level, but Potassium based pollution was notably high. It can be said that Sistan River's chemical pollution is negligible or within the standard bounds defined by World Health Organization (WHO).

Keywords: Sistan River, Suspended Sediment, Particle Size, Sediment Gradation Curve, Wash Load.



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