

THESIS

**ANALYSIS OF SILT DRAWING CAPACITY OF DIFFERENT TYPES OF  
OUTLETS IN AN IRRIGATION SYSTEM**



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# ABSTRACT

Sediment transport is an important aspect in the design and operation of an irrigation system. A large amount of budget is spent for rehabilitation of irrigation system due to sediment deposition.

Outlets play a very important role in the efficient working of an irrigation system. Outlets are designed in such a way that they should draw their due share of water and sediment. But if the outlets do not take their due share of sediments, the sediment load in the channel will go on increasing to an extent that the channel would not be able to carry its design discharge and less water will be conveyed to the tail end.

This study was done to analyze the silt drawing capacity of different types of outlets. The different factors responsible for the sediment drawing capacity of outlets were studied so that they must draw the due share of sediment from the canal to avoid the accumulation of silt. The study was carried out at HAKRA/4-R distributary, which is 58 km long having a discharge of 197 cusecs, 124 outlets and 2 minors.

The sediment and hydraulic measurements were done from October 6, 2001 to November 12, 2001. Sample outlets were selected and suspended sediment and bed material samples were collected from the main channel and d/s of the selected outlets. The samples were analyzed in the laboratory of center of excellence in Water resources Engineering (CEWRE) and International Sediment Research Institute Pakistan (ISRIP). The results of the analysis showed that the results were not extracting the due share of silt which is 110% to 115%, but the observed silt drawing capacity was from 59% to 152%, the relationship of outlet setting with silt drawing capacity was analyzed and the results

showed that outlets will draw the due share of silt if outlet setting of Open Flume, Orifice and Open Flume with Roof lock is 82% to 90%, 74% to 80% and 95% to 97% respectively. Also based on the collected data a relationship in the form of equation was developed for outlet silt drawing capacity using computer software "STATISTICA".

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