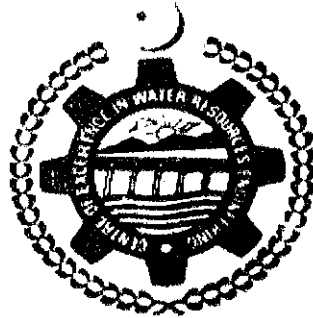


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**THESIS**

**SEDIMENT SIMULATION OF CHASHMA RIGHT BANK CANAL  
FOR ITS EFFICIENT OPERATION AND MANAGEMENT**



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## ABSTRACT

Chashma Right Bank Irrigation Project (CRBIP) is a large irrigation system spread over two provinces (Punjab and North West Frontier Province) of Pakistan. It is fed by the Indus River through the Chashma Barrage. The total command area of the project is 570,000 acres (230,675 hectares) of land on the right bank of River Indus. The canal had been planned to deliver discharge of 4879 cusecs. The main canal length is 170 miles (258 Km.). The distribution system is about 700 miles (1,100 Km.) long and 83 secondary channels irrigate a narrow strip of land between the Chashma Right Bank Canal and river Indus. A maximum silt deposit of 8 feet was measured downstream of RD 295+000 upto RD 377+000, in canal closure period of January 1999, which was more than half of the design depth of the canal.

To simulate this excessive sedimentation in main canal from RD 5+000 to RD 377+000, one-dimensional numerical model HEC6-KC (Kalabagh Consultant) was used. Model gave good match of longitudinal bed profile of the main canal. By using the calibrated parameters, the escape channels, provided along the main canal at RD 98+000 and RD 377+000, were simulated to flush the sediment deposits from the tail reaches. Escapes channels were operated independently for a period of 10-days from September 21 to 30 in every simulation year.

Escape-I has flushed out 57 Ac-Ft sediment volume from bed and the escape-II has flushed out 205 Ac-Ft sediment deposited volume from the canal bed from RD 290+000 to RD 377+000. Sediment deposits upstream of RD 290+000

were not be flushed out by model even after operating the escape for 50 days in five successive years.

Water management strategies given by the Project Management Consultancy for CRBC Stage-III to operate the canal at optimum discharge, were reviewed. As the variability of discharge in Alternative-1 and 2 is very small so these two alternatives have nearly equal sedimentation pattern as compared to other alternatives. However Alternative-2 was considered as most feasible for the canal operation due to lesser sedimentation.

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