THESIS

IMPACT EVALUATION OF SILT EXCLUDER ON SEDIMENT MANAGEMENT OF D.G. KHAN CANAL

By

Muhammad Naveed Anjum
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ABSTRACT

Taunsa Barrage was constructed in 1958 to provide weir controlled supplies to inundation canals in Muzaffargarh and D. G. Khan Districts. Gross command area of canal system served by the barrage is 2,351,000 acres. Two canals namely Muzaffargarh and T.P. Link off-take from the left side of the barrage, and D.G. Khan Canal off-takes from the right side of the Barrage.

The river flow generally approaches to the barrage with an oblique curve entry into the Guide Bank Zone, throwing the right pocket and the D.G. Khan Canal on the intrados of the approach curve with consequent increase in sediment entry and deposit in right half of the barrage. This situation causes the silting up of the canal and reduction in its discharging capacity.

D.G. Khan Canal has an old history of varying sediment problem. Several attempts were made to investigate the problem. To address this sediment problem two silt ejectors were provided earlier in the D.G. Khan canal but the purpose could not be achieved. Present study reviewed the major sediment management problems at D.G. Khan Canal and their possible causes. The sediment management problems were analysed in general and the impact of Silt Excluder on sediment management of D.G. Khan Canal in particular was studied during this study.

The analysis of data regarding sediment entry at the head of the canals indicated that the intervention of Silt excluder in the year 2005–06 reduced the

sediment intake in this canal. The average efficiency of silt excluder calculated during this study was of the order of 44%.

Analysis of average daily sediment entry and sediment transport capacity revealed that the sediment load in D.G. Khan Canal was more than the sediment transport capacity of the canal. The average sediment load entering into the D.G. Khan Canal before the Silt Excluder's interventions was about 260 ppm which was approximately 38% more than the sediment transport capacity of the canal. However, the post-intervention sediment load observed during 2006-09 period was 180 ppm, which was about 10% more than the sediment transport capacity of the canal. Nevertheless, these investigations did reveal that sediment entry was reduced by the construction of the Silt Excluder. Since the current (post-intervention) sediment load is still higher than the sediment transport capacity of the canal, it may cause deposition in the head reach of the D.G. Khan Canal. Therefore, it is necessary to eject the sediment from the canal which is more than the sediment transport capacity of the Canal.