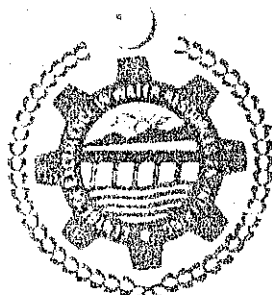


THESIS

**SIMULATION OF LCC EAST CANAL FOR DIFFERENT
MANAGEMENT SCENARIOS**

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ABSTRACT

In Pakistan surface water is distributed through extensive canal network. Aggradation and degradation in the canals change the hydraulic behavior of a channel that ultimately affects the overall system efficiency. Sediment deposition in main canals and distributaries results reduction in irrigation efficiency, increasing the gap between water supply and demand for crop production.

The LCC east canal circle has a length of 1505 miles of irrigation channels while the LCC west canal circle has 1421 miles of main canal and distributaries. During the year 1900, the authorized full supply discharge of Upper Gugera Branch Canal was $217.6 \text{ m}^3/\text{sec}$ ($7679 \text{ ft}^3/\text{sec}$); the design cropping intensity of the system was 75 percent with water allowance of $2.84 \text{ ft}^3/\text{sec}$. However, during the recent years, the cropping intensity upto 173 percent has been achieved due to increased demographic demands.

The main problems involved are the inadequate operation and maintenance of the canal system. The increased cropping intensities and defective operation & maintenance of the system warrant the remodelling of canal for a discharge of $304.72 \text{ m}^3/\text{sec}$ ($10761.09 \text{ ft}^3/\text{sec}$). The Irrigation and Power Department of the Punjab Province of Pakistan has started the execution of remodelling project under the supervision of National Engineering Services of Pakistan (NESPAK).

In this study, the "Simulation of Irrigation Canals" (SIC) model has been used to simulate Upper Gugera Branch Canal for existing and remodelled design geometry at four different discharges. The new cropping intensity and crop water requirements of the command area are fulfilled by the increased discharge. The banks raised by the Irrigation Department were found to be marginal at some of the reaches which have been recommended to be raised to provide reasonable free-board. A sediment modelling study of the system is also recommended.