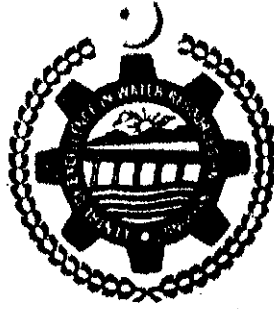


THESIS

**ANALYSIS OF DIFFERENT THEORIES FOR OPTIMAL
ALLUVIAL CHANNEL DESIGN IN INDUS BASIN**



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By

**IRFAN ULLAH
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ABSTRACT

The irrigation system of Pakistan is one century old as most of it was constructed in the start of nineteenth century. During these hundred years not only the condition of these systems become deteriorated with the passage of time but new developments took place of which the closure of three main rivers flows i.e. Ravi, Sutlej and Bias was stopped by India under an agreement with Pakistan called as "Indus Water Treaty" but also the construction of large dams and reservoirs on all rivers for power generation and sustainable water flows for irrigation purposes. These all activities changed totally the morphology of rivers in sense that maximum of silt coming from catchments is now trapped by in these reservoirs and the water coming down started scouring for balancing the silt charge. This not only resulted to fill the reservoir with silt which causes to deplete the storage capacity and life of the reservoir but also a very serious problem for the irrigation systems.

Silt load & grade at head regulators of main canals is reduced due to inter basin transfer of water and construction of many dams on upstream side.

Due to change in silt load and grade, the x-section of canals are changing and trying to bring them to a new regime conditions which may disturb the flow capacities and command capabilities of the canals.

The methods used for the design of irrigation systems have an approach of regime sections of which the silt charge and grade has the main role. As presently not only the silt charge and grade entering in the canal systems is changed but also the silt concentration is changed.

The main purpose of this study is to judge the present condition of the irrigation canal as compared to their original design parameters but also to apply new design techniques not only for the rehabilitation of the existing canals but also for the design of new canals especially in Indus Basin area.

Three canals of Lower Jhelum Canal System namely Lalian Disty, Kirana Disty and Khadir Branch were selected for study purpose. These canals were further divided into three reaches i.e, head, middle and tail reaches where bed material samples, water samples for suspended load calculation were collected and canal x-sections were observed not only for comparison with actual designed section but also with sections calculated from other design methods.

The basic idea of the research was to emphasize on selection of the optimal design method suitable for alluvial canals.

Irfan Ullah