

A MODEL FOR EQUITABLE WATER ALLOCATION  
ALONG WATERCOURSES

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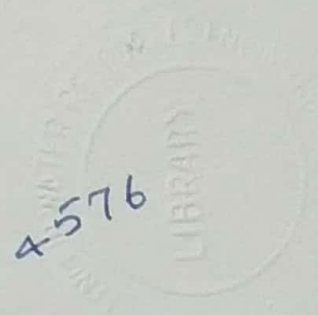
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## ABSTRACT

The primary objective of this research was to study the disparities in the operation, maintenance and revenue collection components of the tertiary irrigation system and to present practicable solutions of water allocation problems in the watercourse command areas. The initiative was taken due to the severe inequity in the existing area based water allocation following a fixed roster of turns.

To meet with the inequity problem, water allocation on volume per unit area basis is searched to be a possible solution. A steady state volume balance mathematical model is developed and verified to allocate water on volumetric basis. This model choice was made due to the imposed system constraints of fixed discharge outlets, rigid rotation of turns and continuous operation of turns. The transient losses of excess water infiltration which wetup dry watercourse banks, the dead storage and water seepage during periods when water is moving from one turnout to the next are simulated by the filling and draining allowances. The steady state seepage is included in the model by assuming a constant loss rate along certain lengths of watercourse sections and it can be varied along different sections and branches of the watercourse.

A field experiment was conducted to collect data for model calibration and verification. The complete operational evaluations of two watercourses were made. The observations

showed the inequity in water distribution up to 55%. The results of the model showed 100% equity in water allocation except for the farmers affected by the poor maintenance and design of the watercourses for which no allowance is made in the model formulation.

Instead of the cropped area method of assessment, volumetric method is recommended for revenue collection. It is expected that volumetric water charging will boost up the ground water development activities by the farmers on their own behalf. An effective and positively responded method for the regular maintenance of watercourses is also proposed. Moreover, a detailed review of the existing equity measures is made. A meaningful research is recommended in setting up the performance measures and standards.