

ABSTRACT

The characteristics of flow over side weirs are taken into account to determine the coefficient of discharge for subcritical flow conditions under the assumption of constant specific energy. The validity of the constant specific assumption is also analysed. The coefficient of discharge is found to depend both on upstream froude number and ratio of sill height to upstream flow depth. Multiple regression analysis is conducted to establish the relationship of C_d with both F_1 and s/y_1 taken together. The characteristics of the spatially varied flow in the main channel with multiple side weir outlets are also examined. The observed water surface elevations for spatially varied flow conditions and Bernoulli's energy equation are used to determine the Manning's roughness coefficient pertinent to spatially varied flow. A computer program is developed to obtain the geometrical parameters of the uniformly discharging weir outlets in a side weir irrigation system. The discharge in the main channel, desired discharges over side weir outlets and the hydraulic and geometric parameters of the main channel are the main inputs to the computer program. The experiments conducted to evaluate the performance of the side weir irrigation system show that the deviations of observed discharges from desired ones over the side weir outlets are

within five per cent for ninety per cent of the test runs and in no case these are greater than ten per cent.

KEY WORDS

Coefficient of Discharge	Energy gradient
Froude Number	On-farm Water Management
Regression Analysis	Roughness Coefficient
Side Weir Irrigation System	Sill Height
Spatially Varied Flow	Specific Energy
Subcritical Flow	Water Surface Profile
Weir Crest	Varied Flow Function