

# **Assessment of Relationships between Rainfall and Canal Water for Maximization of Yield of Major Crops under Telugu Ganga Project Command in Andhra Pradesh**

**Ch Murali Krishna, B Ramana Murhy, N V Sarala, A V S Durga Prasad and M V Ramana**  
Agricultural Research Station(ARS), Acharya NG Ranga Agricultural University, Anantapur, A. P.

## **ABSTRACT**

A study was conducted to assess the variability and relationships of rainfall received, canal water supplied and the yield of major crops viz., paddy, groundnut, sugarcane, sorghum and cotton attained under the Telugu Ganga Project (TGP) command area in Andhra Pradesh during 22 years from 1997 to 2018. Linear and quadratic regression models were calibrated to predict the yield with rainfall received and canal water supplied in different years. The models were assessed based on the coefficient of determination ( $R^2$ ) and standard error of mean (SEM) of the predicted yield. The rainfall received in different years did not significantly influenced the yield of crops as indicated by the non-significant  $R^2$  values. However, canal water released in different years was found to influence significantly the yield of paddy, groundnut, cotton and sugarcane. The quadratic regression models gave higher and significant values of  $R^2$  compared to linear regression models of major crops. A grouping of 22 years data divided into 3 groups based on the mean and standard deviation (SD) of rainfall, canal water and yield of crops viz., observations which are (i) less than (Mean – SD); (ii) lying between (Mean – SD) to (Mean + SD); and (iii) more than (Mean + SD) limits. The canal water and rainfall corresponding to the highest mean yield attained in a group could be considered as optimum for attaining maximum yield of a crop. This will help in the efficient utilization of water resources with regard to the quantity and frequency of canal water to be provided for irrigation of crops. Since the canal water under TGP command is assured, the farmers could efficiently utilize the canal water by growing less water requiring and profitable short duration crops and derive maximum benefit from the available improved agricultural technologies.

**Keywords:** *Canal water, Rainfall, Crop yield, Regression and Optimization*