An artificial neural network(ANN) model for predicting groundnut price

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ABSTRACT

The fluctuating nature of agricultural commodity prices presents a significant challenge for farmers, traders, and policymakers. Groundnut, being a vital cash crop, is no exception. This research focuses on developing a predictive model using Artificial Neural Networks (ANN), specifically the Generalized Regression Neural Networks (GRNN), to forecast groundnut prices. By leveraging data spanning five decades (1966-2016) collected from the Chittoor District of Andhra Pradesh, the study evaluates the model's performance using Mean Absolute Percentage Error (MAPE) and Symmetric Mean Absolute Percentage Error (SMAPE). Diagnostic tests, including the Shapiro-Wilk normality test and Grubbs test, confirmed the suitability of the data for modeling, with no significant outliers detected. The GRNN model effectively predicted groundnut prices for 2017 to 2028, showing an upward trend with prices peaking at Rs. 8314 in 2027. The residual analysis yielded MAPE and SMAPE values of 34.9443% and 44.3991%, respectively, indicating reasonable accuracy despite inherent agricultural data volatility. These results provide valuable insights for stakeholders, aiding in better planning and risk management in the agricultural sector.

Keywords: *Generalized Regression Neural Networks (GRNN), MAPE, Prediction and SMAPE*