Agricultural Commodity Market Analysis and Price Forecasting

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ABSTRACT

In a highly populous country like India, two-third parts of total population directly or indirectly depends on agriculture. To this sector of around 62% population (as of census 2011), agriculture is the main occupation. So, the prediction of agricultural commodity market information, especially short term forecast is highly necessary for the sustainable development of agriculture community. These predictions on different commodities are basically performed with the help of time series models. Other than predictions, this paper mainly focuses on market analysis and data visualization of 10 agricultural commodities. The commodities considered are sub grouped into 4 categories- cereals (Barley, Maize), Oilseeds (Castor, Rape and Mustard seed, Soybean), Spices (Coriander, Jeera, Turmeric), Commercial crop (cotton cake and kappas). The data for time series models and data visualization were collected for the time period of 8 years from January 2016 to March 2023. The dataset (trading statistics) is available in National Commodity & Derivatives Exchange Limited (NCDEX). For data visualization, Python programming is used and for price forecasting Auto- ARIMA model and Regression analysis are used on the collected datasets. Through this analysis, it is found that the market price fluctuations were very low for Jeera and kappas whereas the other 8 commodities have high price fluctuations over the 8 year time period. Python library that automates the selection of optimal parameters (p, d, q) for ARIMA time series models and simplifying the process of forecasting by automatically identifying the best-fit model. It is observed that out of ten commodities nine are in positive slope (increasing trend) except turmeric which shows negative slope (declining trend), and it is interpreted that commodity jeera has highest value of m (slope) i.e., increasing at higher rate. From the dynamic bar chart, it is clearly visible that there is high price fluctuation among all the commodities from 2016 to 2022 except for kappas and Jeera. There is constant price increase in Jeera and Kapas shows very low price fluctuation.

Keywords: Commodity Price Forecasting, Auto ARIMA, Price Trend