FLUCTUATIONS ANALYSIS AND FORECASTS PRICE OF RICE USING FUZZY COGNITIVE MAPS TO INCREASE RICE FARMER WELFARE (CASE STUDY: DEPARTMENT OF AGRICULTURE SURABAYA)

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Abstract

Price Fluctuation Analysis and Prediction using Fuzzy Cognitive Map of Rice (FCM) is performed to determine the price of rice in the future by modeling these factors affect the price of rice. Fluctuations in agricultural circumstances that occurred were analyzed using multiple regression methods to find the most influential parameters are then used as the basis for establishing a model FCM. Application of multiple regression method involves testing the assumptions made by its classical variance inflation factor test and correlation test for multicollinearity problems. FCM models are made of various causal parameters indicate a causal relationship between the variables would not use matrices and diagrams, which in turn is implemented to find the overall condition affect rice price changes that can be used as a solution in predicting the price.

The results of multiple regression analysis showed fluctuations in the factors that most influence on the price of imported rice is a factor and the exchange rate with a regression coefficient of 64.44 and 04.23 This means that the decline in the exchange rate of 64.4% will lead to rice price increases by 1% and increase in imports of 23.4% would raise the price of rice at 1%. And outcome prediction using fuzzy cognitive maps produce
a high enough accuracy to MSE for 0006 which means the use of this method is best used in predicting the price and the standard deviation shows that the trend is quite good with a value of 89%.

Implementation of fuzzy cognitive maps that have been carried out showed that NTP ratio as a standard measurement of farmers' welfare can be achieved by increasing the weighting parameter value of rice production, harvested area and productivity technology. Where both factors harvest technology and productivity are able to raise the amount of rice farmers.

**Keywords:** Fuzzy Cognitive Maps, Analysis Fluctuations, Forecasts Price of Rice, Inter Variable Causal