

**PERAMALAN NILAI TUKAR PETANI SUBSEKTOR TANAMAN
PANGAN PROVINSI BALI DENGAN METODE *SEASONAL
AUTOREGRESSIVE INTEGRATED MOVING AVERAGE (SARIMA)***

Oleh

Kadek Rima Suryani, NIM 2213101007

Program Studi S1 Matematika

Jurusan Matematika

ABSTRAK

Nilai Tukar Petani (NTP) merupakan indikator utama dalam mengukur tingkat kesejahteraan petani, khususnya pada subsektor tanaman pangan yang berperan strategis dalam ketahanan pangan daerah. Penelitian ini bertujuan untuk meramalkan NTP subsektor tanaman pangan di Provinsi Bali menggunakan metode Seasonal Autoregressive Integrated Moving Average (SARIMA). Data yang digunakan berupa data bulanan periode Januari 2009 hingga Desember 2025 yang diperoleh dari Badan Pusat Statistik Provinsi Bali. Tahapan analisis meliputi eksplorasi data, pengujian kestasioneran menggunakan transformasi Box-Cox dan uji Augmented Dickey-Fuller (ADF), identifikasi model melalui analisis ACF dan PACF, serta estimasi parameter dengan Maximum Likelihood Estimation (MLE). Berdasarkan kriteria Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), dan uji diagnostik residual, model SARIMA (0,1,0)(0,1,1)₁₂ terpilih sebagai model terbaik. Evaluasi akurasi menggunakan data tahun 2024-2025 menghasilkan nilai Mean Absolute Error (MAE) sebesar 4,39925 dan Mean Absolute Percentage Error (MAPE) sebesar 4,4316%, yang menunjukkan tingkat akurasi peramalan sangat baik. Hasil peramalan periode 2026-2027 memberikan proyeksi kuantitatif yang dapat digunakan sebagai dasar pertimbangan kebijakan dalam meningkatkan kesejahteraan petani tanaman pangan di Provinsi Bali.

Kata kunci: Nilai Tukar Petani (NTP), Subsektor Tanaman Pangan, SARIMA, Peramalan Deret Waktu.

Forecasting the Farmer's Terms of Trade in the Food Crops Subsector of Bali Province Using the Seasonal Autoregressive Integrated Moving Average (SARIMA) Method

By

Kadek Rima Suryani, NIM 2213101007

Undergraduate Program in Mathematics

Department of Mathematics

ABSTRACT

The Farmer's Terms of Trade is a key indicator used to measure the level of farmers' welfare, particularly in the food crops subsector, which plays a strategic role in regional food security. This study aims to forecast the NTP of the food crops subsector in Bali Province using the Seasonal Autoregressive Integrated Moving Average (SARIMA) method. The data used are monthly data from January 2009 to December 2025 obtained from the Statistics Indonesia (BPS) of Bali Province. The analysis stages include data exploration, stationarity testing using the Box-Cox transformation and the Augmented Dickey-Fuller (ADF) test, model identification through the analysis of the Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF), and parameter estimation using Maximum Likelihood Estimation (MLE). Based on the Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and residual diagnostic tests, the SARIMA (0,1,0)(0,1,1)₁₂ model was selected as the best model. The accuracy evaluation using the 2024-2025 data resulted in a Mean Absolute Error (MAE) value of 4.39925 and a Mean Absolute Percentage Error (MAPE) of 4.4316%, indicating a very good forecasting accuracy. The forecasting results for the 2026-2027 period provide quantitative projections that can be used as a basis for policy considerations in improving the welfare of food crop farmers in Bali Province.

Keyword: Farmer's Terms of Trade, Food Crops Subsector, SARIMA, Time Series Forecasting.