## TIME SERIES APPROACH FOR MODELING AND FORECASTING ELECTRICITY DEMAND IN AMPARA DISTRICT SRI LANKA

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Truncated Electricity is an essential resource for industry, transportation, and communication; thus, it is vital to understand the patterns of electricity usage for the well-being of society and economic growth. A time series approach is employed to model and forecast the electricity demand in the Ampara district of Sri Lanka from January 2019 to November 2023. This study aims to elucidate the complex pattern of electricity consumption across sectors by examining multiple consumption categories including domestic, religious and charitable, public purpose, industrial, government universities, and government hospitals and schools. The study highlights the importance of the domestic category in particular, where consumption varies significantly due to recent increases in unit prices. The study uses unit root tests, time series plots, and descriptive statistics, to determine data stationarity and identify consumption trends. Electricity usage in the domestic category is predicted using the Seasonal Autoregressive Integrated Moving Average (SARIMA) model. Thirteen SARIMA models are thoroughly evaluated using log-likelihood, AIC, SC, HQC, and number of significant coefficients. The SARIMA(1,0,0)(1,1,0)12 is chosen as the best model because of the absence of ARCH effects. Extensive validation on an independent testing dataset improves the model's accuracy and diagnostic tests confirm its reliability. This research is beyond its capacity for prediction and provides a reliable forecasting model with real-world implications for future electricity planning and policy development in the Ampara district. The knowledge gained from this research offers stakeholders and decision-makers in the regional energy sector with useful information.

Keywords: Consumption, Electricity, Forecasting, Patterns, SARIMA, Time series approach.