

Prediction of electric energy consumption in small scale farming system of Rwanda

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Abstract

The objective of this research was to forecast the electricity consumption in small scale farming systems of Rwanda using the easy and simple model, the case study of CAVM (College of Agriculture, Animal Sciences and Veterinary Medicine) - Rubilizi farm located in Kicukiro - Kigali, Rwanda. The classical time series decomposition forecasting model can help in the prediction of electric energy consumption which will simplify budget planning of the farm in terms of future electric energy use. The data analyzed were in a yearly format but subdivided in quarterly data; this was based on the quarterly report of the farm manager. The data analysis has been performed using classical decomposition time series method to forecast energy consumption for one year ahead. This paper clearly explains and presents classical decomposition times series methods in predicting energy consumption of Rubilizi Farm by using data set of 72 months (2009-2014).

The results showed that energy to be consumed in year 2015 were 832, 791, 691 and 881 kWh for quarter 1, quarter 2, quarter 3 and quarter 4 respectively. It has found errors of -0.0014, 0.0005, 6.3091% and 0.241549 respectively for bias, MAD, MAPE and MSE. Based on low values of the errors, it was concluded that the classical time series decomposition method can be used to forecast electric energy consumption in the small scale farm for the future period.

Key words: *Electricity consumption, prediction, classical decomposition, time series, small scale farm*