



EARLY WARNING DETECTION OF RICE PRICE FLUCTUATIONS IN BANDUNG CITY USING TIME SERIES CONTROL CHART

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Abstract: Rice prices in Bandung increase from year to year, but the government of Bandung has not had a scientific method for detecting changes in rice price volatility. Statistically, this means that there is a problem concerning the determination of control charts to monitor small shifts and see if there is any autocorrelation in the price of rice. This study aims to apply a control diagram for the price of rice so that it can detect a significant change of shift in the price of rice in Bandung and get the EWMA control chart to detect a small shift in the process. Implementation of the EWMA control chart and price forecast in 2021 will detect the surge in rice prices significantly. This information is a milestone towards an early warning system of unprecedented restlessness as the main indicator of rice crisis. Rice crises will happen sooner or later, so that accurate information about the prediction of the time for the rice crisis in the city of Bandung, become very urgent. Analysis of rice price movements from time to time, including forecasting in it is an integral part in that context. The results of the study lead to preventive policy to postpone or slow down time rice crisis. Strategic impact is Bandung government will have a clear agricultural strategy oriented in strengthening the resilience of rice.

1. Introduction

Based on data from the National Socioeconomic Survey (SUSENAS) 1990-1999, an estimated 97-100% of Indonesian people consume rice. SUSENAS data on rice consumption in the city of Bandung in 2013 was 113 kilograms per capita per year. This figure is the highest in comparison with other countries in Southeast Asia, such as Malaysia, Thailand and Japan with an average rate of rice consumption does not reach 80 kilograms per capita per year. Based on the background that has been said, we need a mechanism to detect sensitively on the volatility of rice price changes in the city of Bandung in the future. The results of the detection will be preventive policy to postpone or delay the incidence of rice crisis time in Bandung. The consequence is that the government Bandung farming will have a clear strategy regarding food security, particularly of rice. Statistically, this means that there is a strategic need for the establishment of control charts to monitor small shifts and see if there is any autocorrelation in the price of rice in Bandung.

The predicted future increase in the price of rice is reported on (H. Yuyun, M. B. Ismail, M. Mustafa, Sukono, 2013). If the trend of rising prices of rice in the future is not significant, then it gives the information that there is nothing to worry about, because if there is no significant difference between the future and present conditions we can conclude the crisis would not have happened. To examine this, an analysis of rice price movements using statistical control charts.

The use of control charts based on the Seward control chart is often used specifically to monitor uncontrolled process (out of control) and find a special case (assignable causes). Commonly used Shewhart control chart for monitoring processes with large shifts (large shifts) on the process parameters. One disadvantage of Shewhart control chart is only to provide information about the process is based on the observation of the final sample and ignore information that involves the entire sample. In this case it can be said Shewhart control chart is not sensitive to very small shift. A small shift is approximately less than 1.5σ . This causes the Shewhart control chart is not sensitive to small process shifts. Research to detect the movement of the price of rice in Bandung has been done by (Muflikhun, Arief. 2013). The study used Shewhart control charts: Individual Moving Range Chart. The weakness of the method is not sensitive to very small movements (Nur Awlia Sari, 2014). This