Time Series Seasonal Autoregressive Integrated Moving Average Model for Analysis of Rainfall Forecasting: Implementation on Agricultural Insurance

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Author Order	3 of 6
Accreditation	
Abstract	Cilacap is the largest regency located in the southwest of Central Java Province. The rain fall in Cilacap has seasonal variation for monthly period, thus information on rainfall is very important for the Government of Cilacap Regency its people, especially farmers. The usefulness of forecasting method in predicting the volume of rainfall is important. It motivates development of a system that can predict future amount of rainfall. A fluctuation analysis on forecasting result can be used for local governmentÃ¢Â€Â™s policy making purpose. This paper analyses and presents SARIMA method to develop a forecasting model which may support and predict rainfall volume. The dataset for model development was collected from time series data published by Meteorology, Climatology and Geophysics Agency Tunggul Wulung Station from January 2009 to December 2022. The data were divided into data training (to December 2021) and data testing (January to December 2022) groups. The use of data training produced SARIMA model (2,0,2)(0,0,1)12 as the selected model. The model achieved 0.70% for MAPE using data testing. It indicated the final modelÃ¢Â€Â™s capability to closely represent and made prediction based on the rainfall history dataset. The model produced was used to forecast the rainfall from January 2023 to December 2024. The forecast results were analyzed in relation to agricultural insurance program.
Publisher Name	International journal of technology and education research
Publish Date	2024-06-16
Publish Year	2024
Doi	
Citation	
Source	International Journal of Technology and Education Research
Source Issue	Vol. 2 No. 02 (2024): June, International Journal of Technology and Education Research(IJETER)
Source Page	78-103
Url	https://e-journal.citakonsultindo.or.id/index.php/IJETER/article/view/945/801
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