

Muh Ikbal, 2019. **Comparison Vector Autoregressive Integrated Moving Average dengan Generalized Space Time Autoregressive Integrated Moving Average Model for Forecasting Clean Water Use (Study Case : Kota Surabaya, Kab. Gresik dan Kab. Sidoarjo)..** This final project is under advice by Drs. H. Sediono, M.Si dan Drs. Suliyanto, M.Si., S-1 Statistics Courses, Mathematics Department, Faculty of Science and Technology, Universitas Airlangga, Surabaya.

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### ABSTRACT

One of the basic human needs that needed in a sustainable manner is clean water. As the population grows, the demand for clean water has increased over time. It causes clean water problems often occur in areas with a high population. For example the city of Surabaya which has the highest water consumption compared to the national. The high water consumption in Surabaya has an impact on the surrounding area such as Gresik and Sidoarjo. Company that is responsible for water availability are PDAM. Therefore PDAM must strive for and maximize its performance so that the community can get maximum water service. One way to maximize service is by predicting future water demand. Data on water use volume are modeled using VARIMA and GSTARIMA and do a comparison between the two. VARIMA model is a multivariate time series modeling that involves several variables in previous periods. Whereas GSTARIMA model is an extension of VARIMA model that combines interdependence of time and location so that in GSTARIMA model enter location weighting in the model. In GSTARIMA model the parameter estimates are less than VARIMA model and pay attention to spatial and time effects. In this study the data used were 60 insample data and 12 outsample data obtained from three PDAMs, namely PDAM Surya Sembada, Giri Tirta and Delta Tirta. The results of this study show that based on RMSE value between forecasting results and outsample data shows VARIMA model is better than GSTARIMA with autoregressive order ( $p = 2$ ), differencing ( $d = 1$ ) so the best model is VARIMA (2,1,0).

**Keywords :** Clean Water, Time Series, Multivariate, VARIMA, GSTARIMA.