

ABSTRACT

Central Java is one of the provinces with the largest GDP contributions in Indonesia, with three main sectors driving this distribution: agriculture, mining, and industry. These three sectors play a crucial role in promoting regional economic growth. However, this role also comes with a significant trade-off, namely an increase in the emission burden produced. Due to the widespread economic activities of these three sectors, the resulting emissions are also spatially distributed. Thus, spatial econometric analysis can capture and identify the emission distribution patterns. Furthermore, air quality in a region is not only affected by economic activities within that region but also by economic activities in surrounding regions. Finally, measuring the spillover effect of the activities in these three sectors provides a comprehensive picture of the impact of these activities on air quality. The study results show the existence of spatial interdependence in air quality, where an improvement in air quality in one region positively affects neighboring regions (the ρ value is positive and significant). Air quality is negatively and significantly influenced by the variables SO_2 , NO_2 , and industry, meaning that increased industrial activities and pollutant emissions degrade air quality. Additionally, the spillover effect shows that SO_2 and NO_2 have significant direct and total effects on air quality.

Keywords: Air Quality, Spatial Econometric, Spatial Dependency, Spillover Effect