

ABSTRACT

The present study investigated the effects of meteorological systems on Indonesian forest fire and the transport of particulate matters including particulate nitrate (NO_3^-) and sulfate (SO_4^{2-}) leading to the transboundary haze episode that occurred in the Philippines, a representative country in Southeast Asia (SEA) affected by this event. To investigate the prevailing meteorological pattern and the behavior of the pollutants during the event, data and other relevant information were obtained from ground-based stations of DENR-EMB, NASA-AERONET, PAGASA, and satellite data from ECMWF-CAMS and HIMAWARI-8. The data gathered were divided into three periods, namely: pre-haze (before), during the haze, and post-haze (after). Results of the analysis of data showed that the particulate matter concentration and aerosol optical thickness during the smoke haze episodes increased, and the particulate carbon, water-soluble ions, and monosugars likewise increased by a factor ranging from 15% to 288% compared to non-haze periods. Backward and forward air trajectories using the NOAA-HYSPLIT and wind vectors from MERRA-2 were plotted to find the sources of biomass burning to the recurring smoke haze in this region. In conclusion, using air trajectory analysis and the results of aerosol sample analysis using ground-based data indicate that the haze event experienced in the Southern Philippines was influenced by the transboundary air pollution from Indonesia.

KEYWORDS: Transboundary Haze, Emission Burning, Southeast Asia, Indonesia, Philippines, Air Quality