

The impact of the Taal Volcano ash fall to the air pollution problem in Metro Manila, Philippines

Mylene G. Cayetano

Institute of Environmental Science and Meteorology, University of the Philippines Diliman
International Environmental Research Institute, South Korea

Jundy Del Socorro and Joel Tugano

Environmental Management Bureau, Department of Environment and Natural Resources,
Philippines

Daphne Bate

Lung Center of the Philippines

Gerry Bagtasa

Institute of Environmental Science and Meteorology, University of the Philippines Diliman

The air quality in selected road side sites Metro Manila, Philippines, based on PM₁₀ and PM_{2.5}, has been consistently above the annual guideline values in the past five years. In Quezon City, for example, and along a road side site (Epifanio delos Santos Avenue and Quezon Avenue), the annual PM₁₀ exceeded the guidelines from 1% to 40%, from 2012 to 2017, while the PM_{2.5} exceeded the annual guidelines 2% to 180% from 2015 to 2017. Continuous measurements along the Quezon Avenue road side site from 2015 to 2019 reveals the diurnal variation of the PM₁₀ and PM_{2.5}, following the trend in daily traffic during rush hours, hence, the influence of traffic emissions in ambient air. An active volcano located along the south of Metro Manila has recently shown activity and erupted in January 12, 2020. The recent phreatic and phreatomagmatic eruptions of Taal Volcano has brought about tephra and ashes northward, impacting the Southern Luzon and Metro Manila. Using the online PM₁₀ and PM_{2.5} monitoring system located in Quezon Avenue, the impact of the transported ashfall were identified on which days and hours of day. Following a criteria that the increase in PM concentrations must follow the eruption event, and the PM_{2.5} to PM₁₀ ratio must be less than 0.7, it was found that the 2020 Taal Volcano eruption affected the Air Quality in a Metro Manila case study site (Quezon Avenue) from Jan 12-16, Jan 21-22 and Jan 27 to Feb 1. Further verification of the impact using source apportionment studies will be conducted.