ABSTRACT

Lahore, as a most populated city, faces severe consequences of pollution every year, one of them is smog which is now considered as its fifth season. The intensity of the crisis is reflected in the fact that Lahore is among the cities with the poorest air quality. This study used a Haz Scanner Model HIM-6000 to continuously measure atmospheric gases (PM2.5, PM10, NO₂, O₃) over a period of five months in Lahore, Pakistan. The highest value of PM2.5 was recorded as 124.14µg/m³ (Jan) and lowest was 2.18µg/m³ (Dec); the highest value of PM10 was recorded as 565µg/m³ (Dec) and lowest was 6.8µg/m³ (Mar); the highest value of NO₂ was recorded as 70µg/m³ (Jan) and lowest was 2µg/m³ (Jan); the highest value of O₃ was recorded as 598µg/m³ (Mar) and lowest was 1.3µg/m³ (Dec). The study's significance lies in the monitoring duration, as no other research has been done for such a long time. The city's air quality profile is based on the accuracy of data and constant monitoring. This research provides an overview of gases' patterns over the winter season, notably during the smog season. Furthermore, the link between O3 and NO2; and PM2.5 and PM10 is also examined. Higher concentration of gases is also linked to unfavorable weather conditions such as haze or smog, which cause harm to human health, school closures, traffic accidents, and flight delays. During the majority of the research period, PM10 concentrations surpassed EPA and WHO standards. Given the Environmental Protection Agency (EPA) and World Health Organization (WHO) standards; O3 levels were more than double in March. The link between O3 and NOx was investigated, and t was discovered that O₃ has an inverse relationship with NO and NO₂. Moreover, recommendations are made to identify the core causes of recurring smog outbreaks in order to prevent a recurrence and help to mprove air quality of Lahore so that inhabitants may breathe clean air.