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Unexpected air pollution spike in Sri Lanka, November 2019

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Ambient air pollution is a global environmental hazard, particularly affecting urban areas. Sudden spikes of air pollution in the atmosphere in a given area can occur due to many factors, either individually or combined. Generally, local effects are due to anthropogenic sources, while large scale variations occur due to natural events such as dust storms or bushfires and climatic conditions like wind and fluctuations in temperature. During the first two weeks in November 2019, a spike of air pollution prevailed all over Sri Lanka. Such spikes can cause significant adverse health effects in exposed communities. This study aimed to analyze the changing patterns of air pollution in the city of Kandy during this period. Different size fractions of atmospheric Particulates Matter ($PM_{\mu m\ in\ diameter}$; $PM_{2.5}$, PM_{10}, and PM_1) were measured using eight real-time smart air quality monitoring systems called "KOALA" developed by the Queensland University of Technology, Australia. These monitors were located at the National Institute of Fundamental Studies (Sri Lanka) in Kandy between the 23rd of October and the 07th of November 2019. Trends and behaviours of air pollutants were analyzed using time-series graphs. During the study period, an apparent growth of PM variations was observed by 35% for all monitors. Summary results obtained over one week before and the one week during the spike air pollution indicated that 24-hour average $PM_{2.5}$ level in Kandy was 33.3 µg m^{-3} and 51.5 µg m^{-3} respectively. The highest level of air pollution was observed on the 06th of November around 13:00 hours. During this period, the typical daily pattern of air pollution changed. According to global wind model, the wind patterns in the Indian subcontinent may have contributed to this severe air pollution condition occurred in Sri Lanka as a result of high pollution levels in New Delhi.

Keywords: air quality, PM$_{2.5}$, smart air quality sensors