

Effect of Visitor Presence to the Ambient Air Quality Levels in Horton Plains National Park (HPNP), Sri Lanka

Danushka C. Ranathunga^{1,*}, Enoka P. Kudavidanage², HDS Premasiri³
^{1,2}Department of Natural Resources, Sabaragamuwa University of Sri Lanka
³National Building Research Organization, Ministry of Disaster Management
*chandimalrane@hotmail.com

Visitor statistics of Horton Plains National Park (HPNP) clearly indicate that the number of visitors are in increasing trend and parallel increment of vehicles entering the park each year. But, the park does not have any regular air quality monitoring system yet and any measures have not been employed to tackle air pollution caused by visitor presence. In view of this, it was needed to carry out a study to determine current ambient air quality levels and to identify proper mitigatory measures for air pollution in order to enhance the air quality levels in HPNP.

From this study, current levels of Nitrogen Dioxide (NO²) and Sulfur Dioxide (SO²) concentrations in ambient air in HPNP were measured using “Passive Gas Sampling Technique”. Sampling was conducted in twelve sites including two background sites extending from November 2016 to February 2017.

Nitrogen Dioxide concentration variations were highly subjective to the visitor presence than that of Sulfur Dioxide concentration variations. Higher levels of pollution took place during the December visitor peak season. Insignificant positive correlations with visitor presence were observed for both NO₂ and SO₂ levels except for background sites. The highest two weeks mean concentrations of NO₂ and SO₂ were recorded at Car park and Pattipola road with a value of $3.67 \pm 1.92 \mu\text{g}/\text{m}^3$ and $17.68 \pm 4.58 \mu\text{g}/\text{m}^3$ respectively. Whereas, the highest variation of both NO₂ and SO₂ was observed in the Ohiya road ranging from $1.02 \mu\text{g}/\text{m}^3$ to $6.41 \mu\text{g}/\text{m}^3$ and $4.75 \mu\text{g}/\text{m}^3$ to $21.14 \mu\text{g}/\text{m}^3$ respectively. Results indicated slightly higher ambient levels of SO₂ than that of NO₂ levels.

Burning of fossil fuels, burning of natural gas for cooking purposes at the accommodation facilities, and smoking etc. have led to elevate the air pollution levels at HPNP. It was also recommended to investigate any transboundary air pollution effect on the ambient air quality levels in Horton Plains National Park.

Although the current air quality levels are in the acceptable range, there is a potential threat to this unique ecosystem with the rapid increment of visitor presence in the future unless the proper mitigatory actions are not met.

Keywords: Air Pollution, Fossil Fuel Burning, Horton Plains National Park, Nitrogen Dioxide, Sulphur Dioxide, Visitor Presence