

Raeesa Moolla, Expert Opin Environ Biol 2018, Volume:7 DOI: 10.4172/2325-9655-C8-040

World Summit on CLIMATE CHANGE & GLOBAL WARMING

International Conference on BRAIN STIMULATION

November 26-27, 2018 | Tokyo, Japan



Raeesa Moolla

University of the Witwatersrand, South Africa

Risk assessment of BTEX concentrations on communities around an international airport in South Africa

ir traffic has had a prolific increase over the years in Aresponse to economic growth. The increase in demand for aircraft use requires expansion of the existing airports and development of new ones. Environmental concerns arise because airports contribute to the poor air quality in their vicinities because of emission of toxic chemicals which are detrimental to the health of the residents. The dispersion of these chemicals is affected by meteorological conditions prevailing in the area (viz. temperature, wind, humidity, precipitation), as these lead to dilution and photochemical reactions of the pollutants. Little information is available on the potential health risks of these pollutants and evidence suggests that with climate change, VOCs emissions are set to rise. A risk assessment study was conducted in two informal settlements, Malatjie and Joe Slovo, in Johannesburg, South Africa, in close proximity of the International Airport. Through use of Radiello passive samplers, BTEX concentrations were monitored in each settlement. Meteorological data was obtained from the South African Weather Service, to assess the wind direction and speed affecting dispersion of the VOCs. An average of 12.12 μ g/m³, 25.59 μ g/m³, 3.78 μ g/m³ and 43 μ g/m³ for benzene, toluene, ethylbenzene and xylene concentrations respectively; were monitored for Malatije area. An average of 4.78 μ g/m³, 8.12 μ g/m³, 2.14 μ g/m³ and 6.47 μ g/m³ for benzene, toluene, ethylbenzene and xylene concentrations respectively; for Joe Slovo settlement were obtained. The prevailing wind direction was north with very light wind speeds of between 0.50 and 2.10 m.s-1. Furthermore, it was established that the airport was not the sole contributor to the BTEX concentrations; and that other sources were involved. However, the risk assessment showed that there were no obvious non-cancer risks for both areas but the cancer-risk was heightened, underlining a public health concern, and a need for further investigation.

Biography

Raeesa Moolla has attained her PhD at the age of 30, from the University of the Witwatersrand, where she is serving as a tenured Lecturer. Her research interests lie in hotspot monitoring and modelling of urban-scale air pollution and its impacts on human health; specifically related to VOC emissions and pollution from the transport sectors. She is also involved in surface and tropospheric ozone research; and is a part of the International Global Atmospheric Chemistry project (a non-profit organization). She currently has over 25 publications and conference proceedings to her name, and additional five publications are under review.

raeesamoolla@gmail.com

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