

2006, International Year of Deserts, Desertification and Dust

Desertification ranks among the major environmental challenges of the 21st century and is defined by the United Nations Convention to Combat Desertification as 'land degradation in arid, semiarid, and dry subhumid areas resulting from various factors, including climatic variations and human activities'. Currently, desertification affects a total area between 6 million and 12 million square kilometres and generates large loss of income, estimated at US\$42 billion each year. Areas threatened by desertification occupy 34% of the Earth's land area and are home to about 2 billion people.¹

Desertification is taking place due to population pressure, and socioeconomic and policy factors, which lead to overgrazing, deforestation, and poor agricultural practices. In addition, rainfall shortages enhance degradation in the fragile drylands ecosystems. The Sahel of West Africa is one of the areas most affected by desertification. Ecosystems are deteriorating under the increasing pressure of poor populations totally dependent on their environmental resources for their survival. In addition, climate models used to simulate the future climate of the Sahel suggest that the dramatic droughts of the 70s and 80s may become permanent by 2050 as a result of increasing greenhouse gases.²

Desertification-related processes, such as the resulting reduction of vegetation cover, increase the formation of dust storms.³ These, in turn, affect cloud formation and induce aridification of the drylands⁴ but also directly impact air quality.⁵ Respirable particulates, smaller than 10 µm (PM₁₀), cause morbidity and mortality. In Taipei, Taiwan, an increase of 7.66% in respiratory diseases (+1.12% per 10 µg/m³ increase in PM₁₀) and 4.92% of the total mortality (+0.72% per 10 µg/m³ increase in PM₁₀) have been recorded during large Mongolian dust outbreaks.⁶

The main source of atmospheric mineral dust is the Sahara and its desertified margins that produce about half of the yearly global mineral dust production.⁷ Saharan dust is often transported far away from its sources and causes air quality deterioration from Europe to the south-eastern United States.^{8,9} In the Caribbean

island of Trinidad, African dust clouds have been associated with increased paediatric asthma accident and emergency admissions.¹⁰

In Niger and Mauritania, recent estimations show that mineral dust accounts for 106 and 137 annual daily exceedances of the 50 µg/m³ PM₁₀ limit value, 15 to 20 times the forthcoming EU standard, which states that the limit value cannot be exceeded more than 7 days per year.^{11,12} These figures are alarming since urban air pollution resulting from increasing traffic of old and badly maintained vehicles and from individual fires for cooking purposes are not considered.

In the Sahel, the incidence of meningococcal disease has been correlated with dry and dusty conditions¹³ and we know that grass-roots communities consider wind erosion related health problems as more important than crop damage or loss of topsoil.¹⁴ The human health threat of mineral dust is therefore real despite statistical evidence from West African studies because particulate air pollution data are currently nonexistent.¹⁵

The General Assembly of the United Nations has declared 2006 the International Year of Deserts and Desertification.¹⁶ We hope it will be the occasion to develop some important fields of research, especially the desertification-related impacts on health.

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